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ABSTRACT

The 1967 investigation to examine and assess the Hamline University Library's role in Hamline's educational program and to identify directions for its contributions to this program in the future are summarized in this study. The results of this study showed that the Hamline University was not meeting the information needs of the faculty and students. Based on the prediction that informational material will continue to increase in amount and diversity and that user needs will follow the same trend, it was apparent that, if the library continued to operate in the traditional mode, its contribution to the educational program would become progressively less significant. Thus, it was recommended that the library increase both services and resources by adding a switching center service. This service would establish a detailed specification of user information requirements and attempt to satisfy these requirements either through the collection at the Hamline University library or by tapping the collections and services available at other information centers. With these arrangements the library could provide information support for all aspects of the educational program. The workability of the switching center system was demonstrated. (Author/NH)

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A FEASIBILITY STUDY FOR ESTABLISHING AN INFORMATION SWITCHING CENTER AT HAMLINE UNIVERSITY

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A Feasibility Study for Establishing An Information Switching Center at Hamline University

I. Introduction

A. Background of Previous Descriptive Analysis

In 1967 The Hamline University Library under the sponsorship of the National Science Foundation initiated a study to examine and assess its role in Hamline's educational program and to identify directions for its contributions to this program in the future. In order to provide a complete picture, the study undertook to describe in some detail (1) the library operations and functions including personnel requirements and processing and service costs, (2) the information requirements of the members of the faculty and student body, and (3) the other libraries and information centers used by the Hamline faculty and students. The methods and results of this initial investigation are summarized here.[1]

The description of the library was accomplished through (1) structured interviews with key personnel in each of the library's major departments: Acquisitions, Cataloging, Serials, Circulation, and Reference, (2) direct observation of book ordering and processing procedures, and (3) tabulation and analysis of library records. Information obtained from these three sources led to a detailed specification of the steps involved in acquiring, processing, storing and circulating books and periodicals, and a general characterization by academic area of the material held in the collection.

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[1]Anne W. Schumacher, "A Small College Information System: An Analysis and Recommendations," 1968.

In order to establish a general understanding of user information requirements, open-ended interviews were conducted with a large percentage of the faculty and a number of students representing each academic department of the college. Specifically, these interviews were focused on describing the major activities of the faculty and students which required information support and the ways in which these requirements were satisfied. For the faculty members, these activities included teaching, administrative and committee work, and personal/professional endeavors; for students they included term papers, independent study projects, and general outside reading assignment.

Sources of information (libraries and information centers) remote from the Hamline campus were described through interviews with head librarians and by obtaining pamphlets and other documentation on services and materials. These descriptions were aimed at identifying collection strengths and weaknesses and in delineating the services offered and the procedures and costs associated with obtaining each service.

In general, the results of this study showed that the Hamline library, operating in a traditional mode, was not adequately meeting the information needs of the faculty and students. Through the interviews with the users, it was determined that many of their needs for materials and services were being satisfied by means other than the Hamline library. Both faculty and students found it necessary to go to other libraries to search for and obtain the materials they needed to support the performance of their academic tasks. It was also apparent that if the library continued to operate in the traditional mode, its contribution to the educational program

would become progressively less significant. This conclusion was based on the prediction that the generation of informational material will continue to increase in both amount and diversity and that user needs will follow this trend. With a limited budget, and the requirement to process and store all materials acquired, the library will necessarily fall further and further behind in its attempts to make relevant material available.

Based on these findings, it was recommended that the library undertake to increase both services and resources by adding a switching center service. This service would first work to establish a detailed specification of user information requirements and second, attempt to satisfy these requirements either through the collection at the Hamline library or by tapping the collections and services available at other information centers. External information resources include other college and university libraries, government information centers, civic and social agencies, industrial organizations, and professional societies. Switching center personnel would develop methods for assessing user requirements and would set up procedures and working agreements for obtaining materials and services from other information facilities. Having these arrangements established through the library should be more efficient than having each individual user make his own arrangements. In concept, the library would be in a position to provide information support for all aspects of the educational program thus freeing the faculty and students from the tasks of searching for and obtaining informational materials from sources remote from the Hamline campus.

The major aspects of the switching center service include:

- Information specialists on the library staff would function as a support organization, diagnosing needs of users on a continuing basis and locating appropriate sources for satisfying those needs.

- Information specialists would become more directly and actively involved in the educational process, working out explicit procedures by which to interact with faculty and students to provide support for their activities.

- Formal arrangements would be set up with external sources of informational materials and services corresponding to categories of identified user needs.

- Internally, the center would be geared to process large numbers of information requests, obtain relevant material, disseminate materials to users within specified time frames, obtain feedback from users on adequacy of the material, monitor new demands, and be aware of new materials as they become available.

Figure 1 provides an overview of the proposed system. First, main categories of users are identified and their information-related tasks defined. The information requirements associated with each task are identified and analyzed to derive a responsive set of information services. The materials required are obtained through the switching center either from the library or from relevant external resources. Information specialists on the switching center staff perform additional services on requested materials as needed (e.g., abstracting, data compilations, etc.). The materials are then made available via the library or delivered directly to the user who in either case evaluates their usefulness to his task. This evaluative feedback serves to modify the services provided by the system.

B. Purpose of Current Feasibility Test

The purpose of the present study was to test the feasibility of establishing a switching center service as part of the Hamline University library. The areas of feasibility to be explored included:

- The ability to provide a sufficiently detailed statement of user information requirements to serve as a basis for designing information services.

- The ability to set up cooperative arrangements with a sufficient number of external resources having materials and services relevant to the needs of the system.

- The ability to identify and establish system internal processing procedures required to fulfill different kinds of user requirements.

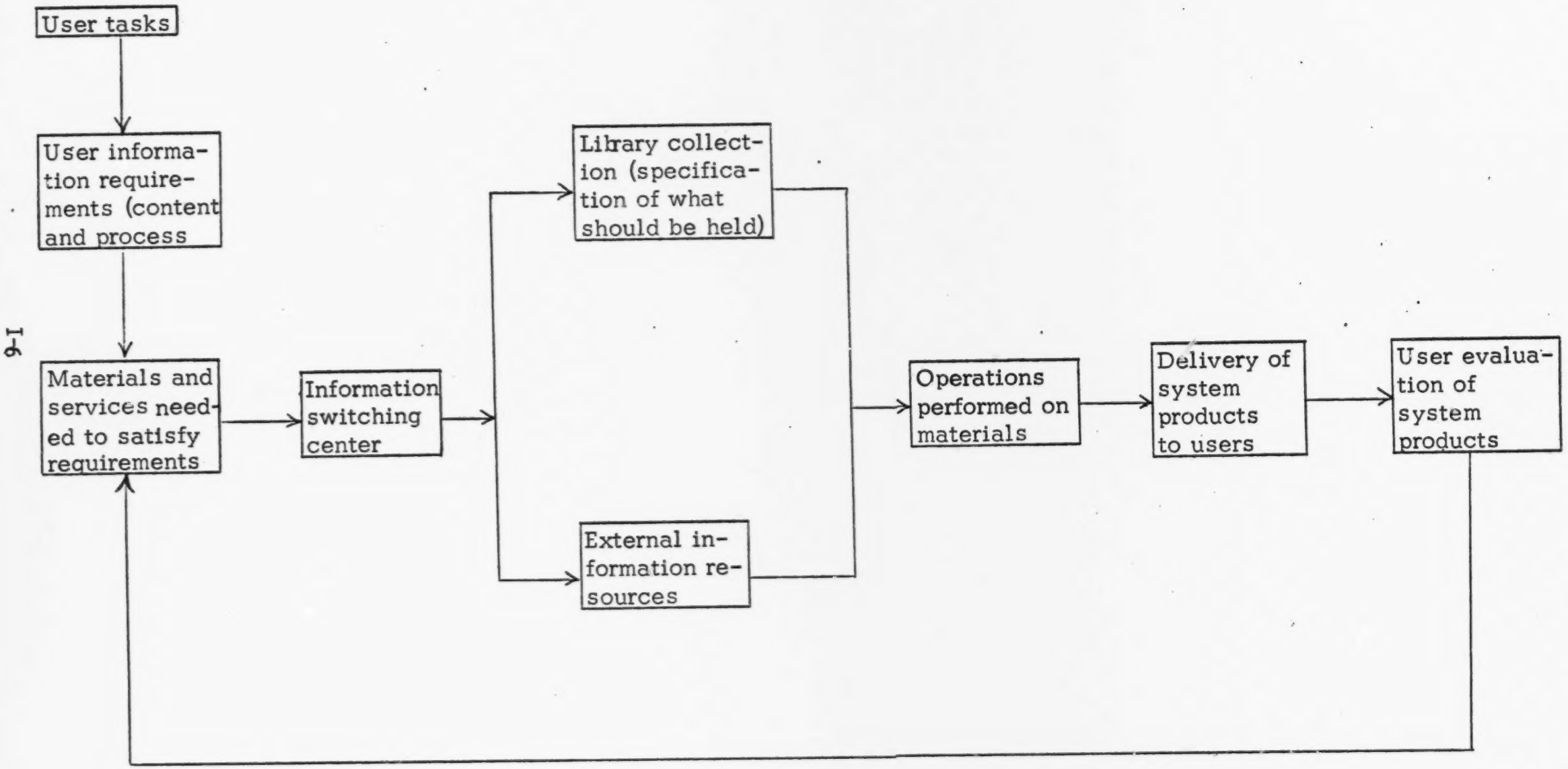
The results of the feasibility study will serve as a basic input to the proposed development and implementation of an information system for Hamline University.

C. Approach to Feasibility Test

One major focus of the feasibility study was the detailed specification of services to be performed by the switching center system. The approach taken was to derive these service requirements directly from the information needs associated with the major course-related tasks performed by the faculty and students. Task models were developed for five selected courses in which categories of information need (e.g., current awareness) were delineated for each major task (e.g., selection of topics to be included in the course). From these information needs, sets of service characteristics were developed. It was felt that tying the services directly to the users' tasks would enable the system to be more efficient in providing direct support and would facilitate evaluation of system products. The efficiency would result from the fact that each service or each set of materials provided to the user would be provided for a specific

Figure 1

Overview of Switching Center:
Concept of Operations


User tasks
User information requirements (content and process
Materials and services needed to satisfy requirements
Information switching center
Library collection (specification of what should be held)
External information resources
Operations performed on materials
Delivery of system products to users
User evaluation of system products

purpose -- the accomplishment of a specific task. Thus, the services included in the system would be specifically useful, not simply of general value. From an evaluation standpoint, each service could be examined in terms of its contribution to the task being performed. It was not expected that the task analytic approach would result in the identification of many new information services; however, it was anticipated that it would provide (1) a basis for determining user demand levels for each service and time constraints on the provision of services, (2) a set of guidelines for efficiently organizing the provision of these services from the standpoint of system internal operations.

A second major focus involved the development of a content structure to aid in organizing the subject areas treated in each course and to facilitate access to the materials included in these subject areas. This content structure was derived from a subject analysis which was designed specifically to reflect the professor's organization of the course content and the terminology he used in referring to the subject matter. This structured orientation to the content should be of value to professors and students in organizing study and in specifying topics for projects and papers.

The third major focus was the characterization of potentially relevant external information resources. This was accomplished through the use of a survey questionnaire mailed to other college and university libraries, industrial organizations, civic agencies, public libraries, and government information centers. The major areas addressed in the questionnaire

included: (1) the collection strengths and weaknesses, (2) the materials and services available, (3) the procedures required to make use of these services, (4) the average turn-around time associated with each service, and (5) the cost for the use of each service. The results of this survey were used to construct an external resource characterization file.

The fourth major area was the specification of the internal system tools and procedures. To provide a clearer definition of what was specifically required, the switching center was operated in an experimental mode; initial development of policies, procedures, and tools proceeded concurrently with the actual determination of real information requirements and the attempts on the part of the system personnel to provide services using the resources of the Hamline collection or other information sources. One of the principal functions of the system personnel during the experimental operation was to translate the content structure derived from the course and the professor's terminology into the organization and terminology used by external information sources.

D. Major Findings and Recommendations

Feasibility of the switching center concept was demonstrated by the following results:

- User needs could be adequately structured to provide a basis for the identification and provision of information services by the system. For each task or activity involved in the teaching process, the information requirements needed could be delineated and the services required to provide the needed information could be specified by means of the task analytic approach.

- Content structures developed for some courses proved useful to both the professor and the students in understanding the content and specifying study topics.

- Of the 195 external information sources identified as relevant to user interest areas, 87% offer services which have potential uses. The major areas of available services included: photoduplication, preparation of bibliographies, circulation of acquisition lists, interlibrary loan, selective dissemination, translation, and referrals.

- As a result of the experimental operation, a number of system tasks were identified and a set of preliminary procedures and tools were developed for the internal operations of the switching center.

Based on these results, it is recommended that the switching center be further developed, evaluated, and implemented at Hamline University. This will involve the operation of the system in a pilot mode with a limited number of users, the generalization of pilot system results to the entire population of users, and the large scale implementation of the system.

E. Organization of the Report

The remainder of this report is divided into 4 major sections. The first two sections describe the methods used and the tools developed to describe user information requirements and the external resources which potentially match these requirements. The third section deals with how the system uses these and other tools in its internal operation and in its provision of services. The fourth section presents the conclusions drawn from the results of the feasibility study.

II. User Information Requirements

A. Introduction

To design an information system which is responsive to the needs of its users requires a complete and detailed specification of (1) the kinds of informational materials and services required by the users and (2) the level of demand and the time constraints associated with each service. One of the major aspects of this study was to examine the feasibility of developing such a description.

At a small liberal arts college the principal function of the professor is teaching and the main activity of the student is attending classes and preparing assignments. Thus, the academic course can be considered as the primary generator of information requirements for the professor in terms of preparing, teaching, and evaluating the course and for the students in terms of outside reading and report preparation. The initial step in the structuring of requirements, therefore, was the development of descriptive models of the teaching-related tasks performed by a selected group of professors. The process of preparing for and conducting a college course could be analyzed into component sub-tasks; and for each task identified, it was possible to determine the kinds of information materials and types of services which would aid in its performance.

Paralleling this effort was the development of user-specific content structures for some of the selected courses. Subject analyses and

structured lists of subject headings were developed to reflect the professors content perspective, organization, and use of terminology. Further expansion of these tools is planned on the basis of feedback from student experiences with them.

Since student information needs are primarily dictated by the course structure and the professor's expectations of tasks to be accomplished and level of content knowledge to be achieved by the student, student information requirements were identified by discussions with the professor, through observation of the students' tasks as they occurred during the course, and by interviews with selected students following course completion.

B. Selection of Pilot Users

Five faculty members were included in the feasibility test. There were several considerations involved in the selection of the participants and the courses to be supported. These include:

- The professors selected should be interested and motivated. The development of a task analysis and a content analysis requires many hours of hard work for each participant. Success is based on two major factors: (1) the participants' belief that the initial time investment will have a valuable pay-off and (2) the participants' awareness of their need for improved information service.

- The courses selected should be in dynamically changing content areas, present a variety of teaching approaches, and represent different levels of student backgrounds. It was important to choose courses that would maximize the variability of service requirements encountered.

- The topics treated in the courses should be in content areas where information resources can be identified and where efficient service arrangements can be worked out.

The courses selected were (1) Economic Issues and Institutions, (2) The Age of Revolution, (3) Racial and Cultural Minorities, (4) Cell Structure and Function, and (5) Organismic Form and Function. The economics course is offered every term and is primarily for underclassmen. The history course is offered annually primarily for majors. The sociology course also offered annually is open to all students and attracts a very diverse student group. The two biology courses are completely new and being taught for the first time as part of major curriculum revision by that department.

C. Development of Task Analyses

Through a series of interviews, each professor was asked to describe in as much detail as possible the general concept and purpose of the course and the steps he performed to prepare and teach the course. The discussion conducted at the first meeting was general and for the most part unsystematic. From the results of this discussion, first approximation task models were developed which provided a framework for the second round of interviews, etc. At each successive stage new and more detailed model representations were developed and in turn discussed and revised. The end result was a detailed description of the tasks required in the teaching process, the guidelines or considerations involved with each task, and the types of information required to aid in the performance of each task (examples in Appendix A).

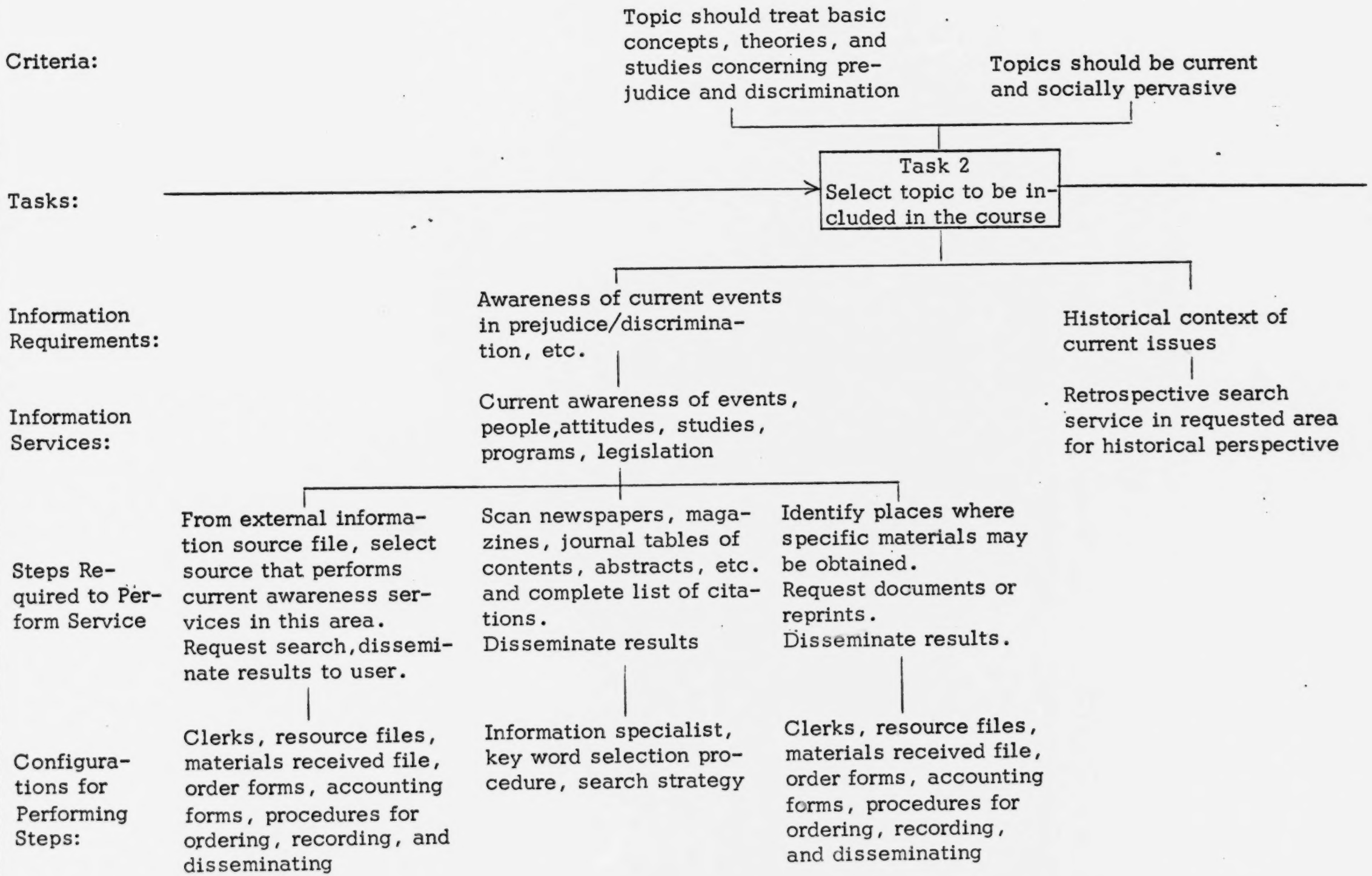
Two basic teaching models were identified: the first was based on

the lecture approach to teaching, the second stressed the teaching of processes through student participation. In actual practice elements of each model are likely to be found in any given course. The second approach required a significant amount of interaction between the professor and the students and significantly more information for all than the lecture approach. For the lecture-oriented approach most of the tasks requiring information support were concentrated in the course preparation phase. The major tasks identified include: specifying course objectives, selecting topics to be included in the course, choosing textbooks and supplementary reading, and preparing material for presentation. Many of the information requirements for these tasks can be anticipated in advance. For the process-oriented approach, many of the information-related tasks occur during the conduct of the course and their requirements cannot be anticipated in advance. These include perform laboratory problems (or experiments), and select, develop, interpret, and report on topics. Providing information support to tasks performed during the course requires quick response information services.

It may be helpful at this point to look at an example of a task and see how it can be elaborated to the point of specifying the combinations of system personnel and procedures to perform a specified service in response to a specific information requirement. Figure 2 shows one section of a task model. The model indicates that for the Topic Selection task, Professor A is guided by two major considerations (criteria) and has two primary areas of information requirements. From these stated requirements, a set of information services can be derived and the steps required by the system to perform these services can be specified. The final stage

Figure 2

Racial and Cultural Minorities Course
Task Category: Course Preparation


Criteria:
Topic should treat basic concepts, theories, and studies concerning prejudice and discrimination
Topics should be current and socially pervasive
Tasks:
Task 2
Select topic to be included in the course
Information Requirements:
Awareness of current events in prejudice/discrimination, etc.
Historical context of current issues
Information Services:
Current awareness of events, people, attitudes, studies, programs, legislation
Retrospective search service in requested area for historical perspective
Steps Required to Perform Service
From external information source file, select source that performs current awareness services in this area. Request search, disseminate results to user.
Scan newspapers, magazines, journal tables of contents, abstracts, etc. and complete list of citations. Disseminate results
Identify places where specific materials may be obtained. Request documents or reprints. Disseminate results.
Configurations for Performing Steps:
Clerks, resource files, materials received file, order forms, accounting forms, procedures for ordering, recording, and disseminating
Information specialist, key word selection procedure, search strategy
Clerks, resource files, materials received file, order forms, accounting forms, procedures for ordering, recording, and disseminating

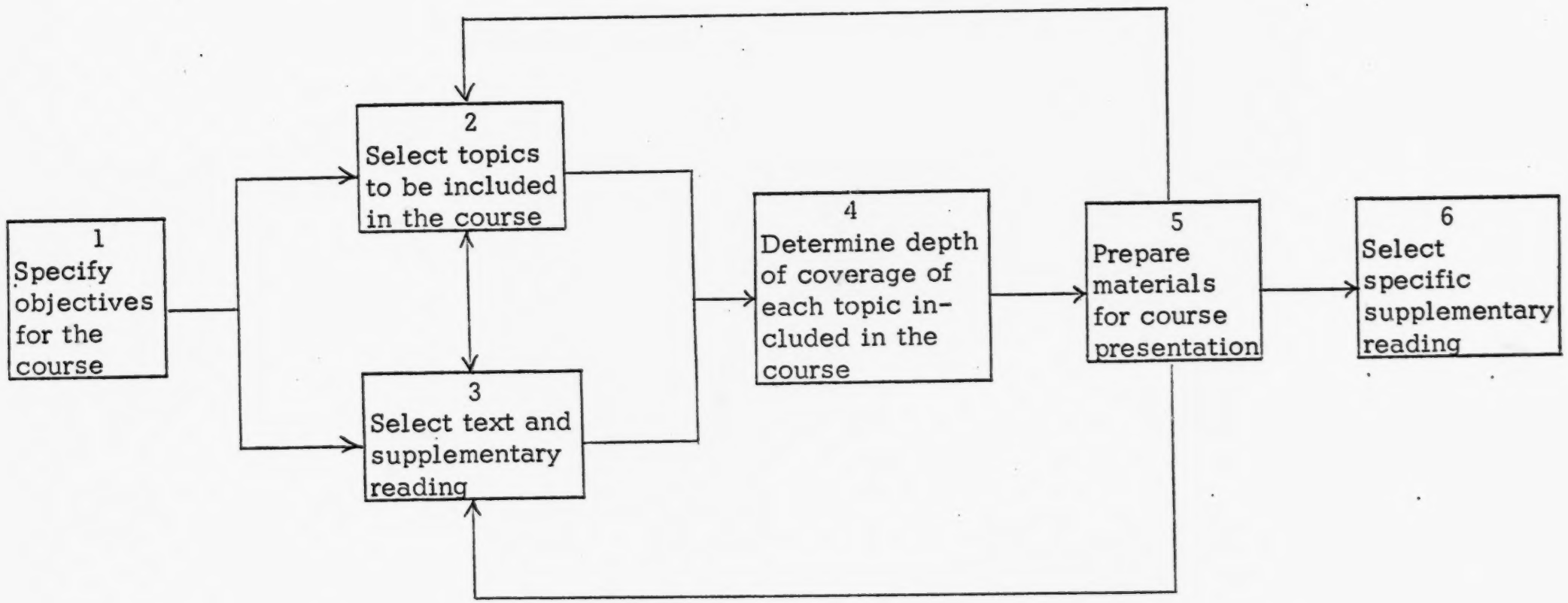
in the modeling is the determination of the personnel and procedures best suited to the performance of each step. Theoretically, all materials and services provided can be directly tied to one of the tasks being performed by the professor.

D. Tasks, Criteria, and Information Requirements

1. Course Preparation Tasks

The principal tasks in the course preparation and their relationships to each other are shown in Figure 3. The first task is the specification of objectives for the course, i.e., the determination of the professor's goals for the effect of the course on the student. Three general goals were identified: (1) acquisition of content knowledge, (2) development of skills in methods and techniques, and (3) establishment of appropriate attitudes toward the general subject field. Each professor in the interview sample was concerned with achieving all three goals to some degree; in all cases, however, one of the three goals was emphasized. Three professors were primarily concerned with instructing the students in the methods of the field, one with increasing the students' grasp of the content, and one with development of educated attitudes. For those courses where the emphasis was placed on methods, a substantial amount of student involvement and participation was required (i.e., learning by doing). In the courses where attitude development and content acquisition were of primary concern, the lecture method was the principal means of instruction. Only one of the five professors identified areas of information needed to help in the specification of course objectives (see Table 2). In general, this task involved the development of the professors philosophical

Figure 3
Course Preparation Tasks and Their Interrelationships



orientation towards the course and the subject matter of the field.

The second task in the course preparation phase concerns the selection of topics to be included in the course. Table 1 lists the criteria used by each professor in topic selection. These criteria specify the characteristics which a topic should have to be considered for inclusion in the course. Some examples of such criteria are:

- Topics should treat basic concepts and theories.
- Topics should be current.
- Topics should be broad in scope and have wide influence.
- Topics should provide tools/methods for making generalizations from specific experiences.
- Topics should be characterized as multidimensional, having several branches and subtopics.

The information requirements associated with topic selection are shown in Table 2. These information requirements can be classified in 3 general categories: (1) information concerning student background, level of sophistication and interest, (2) information on department curriculum at Hamline and at other universities teaching similar subjects, and (3) information characterizing the topic areas in the field. Some examples of the third category include: currency, maturity and sphere of influence of each topic considered, theoretical and historical context, underlying relationships in the subject field, and basic issues and problems.

The third task in course preparation is the selection of a textbook and the supplementary reading materials for students. Some of the professors considered this to be two separate tasks with the Supplementary Reading Selection task occurring later in the course preparation (see

Table 1
Criteria

Subject	Select Topics to be Included in the Course	Select Textbooks and Supplementary Reading Sources	Determine Depth of Coverage for Each Topic	Prepare Material for Course
Sociology	. Topics should treat basic concepts, theories and studies concerning prejudice and discrimination . Topics should be current and socially pervasive	. Recency of publication . Facility of style . Comprehensiveness of coverage . Organization of text: major topics should be treated one at a time; all topics should be treated in each chapter . Supplementary material should compensate for text content weaknesses . Supplementary material should emphasize recent and critical issues . Supplementary material should provide good coverage of a narrow topic	. Currency and urgency of topic . Pervasiveness of topic	. Audio-visual aids should be used where possible . Level of topic presentation should match student level of sophistication . Guidelines for scanning, abstracting, extracting, summarizing information
Economics	. Topics should be well developed, mature issues . Topics should be current . Topics should be broad in scope, should have wide influence on economic picture	. Materials should provide adequate coverage of the topic of the level of sophistication appropriate to student characteristics	. Pervasiveness of issue/topic	. Guidelines for scanning, abstracting, extracting, summarizing information

Table 1 (Cont.)
Criteria

Subject	Select Topics to be Included in the Course	Select Textbooks and Supplementary Reading Sources	Determine Depth of Coverage for Each Topic	Prepare Material for Course
Biology 15	. Topics should emphasize cell function rather than cell structure . Topics should emphasize general concepts and principles of living things . Topics should provide tools/methods for making generalizations from specific experiences	. Text should emphasize cell biology from experimental point of view . Text should integrate lab and lecture sections of the course . Text should supply minimum of basic concepts and terminology		. Current state of subject matter in rapidly evolving areas should be presented to student . Audio-visual aids should be used when possible
Biology 16	. Topics should emphasize plant and animal structure and function at the organismic level . Topics should include application of materials to content areas . Laboratory topics should be broad enough to allow students to work at different levels depending on their ability	. Text organization should be comparable with course . Text should include both plants and animals . Supplementary materials should give good coverage to single topics		. Lecture materials and laboratory exercises should be integrated
History	. Topics should be characterized as multi-dimensional, having several branches and sub-topics	. Material complexity should match with student level of competence		. Audio-visual aids should be used when possible

Table 2
Information Requirements

Subject	Specify Objectives for the Course	Select Topics to be Included in the Course	Select Textbook and Supplementary Sources	Determine Depth of Coverage for Each Topic	Prepare Materials for Course
Sociology	. Student characteristics (background) . Cultural context of existing society . Basic sociological principles and concepts	. Current events in prejudice, discrimination, etc. . Historical context of current issues	. Recent publications in selected topic areas . Characteristics of available materials: depth of coverage; level of treatment	. Availability and depth of coverage of material per topic . Student characteristics: amount of information on racial issues	. Specific content material related to topics and subtopics . Information on local groups interested in reducing social tension . Most often cited studies in each major topic area . Historical context of current issues
Economics		. Student characteristics . Students' expressions of interest in a topic . Theoretical issues covered in next set of courses . Characteristics of topics: currency, maturity, sphere of influence	. Recent publications . Level of sophistication of available documents covering topic . Level of sophistication of students	. Availability and depth of coverage of information per topic	. Specific content material related to topics, subtopics

Table 2 (Cont.)
Information Requirements

Subject	Specify Objectives for the Course	Select Topics to be Included in the Course	Select Textbook and Supplementary Sources	Determine Depth of Coverage for Each Topic	Prepare Materials for Course
Biology 15		. Curriculum development discussions of Biology faculty . Student background	. Information on recent publications	. Recent professional literature on topics to be covered	. Location of all references included in the text . Professional literature for assignment to students (on individual or class basis) . Content material for lab exercises . Preview of audio-visual aids . Answers to specified questions . Student ability and accomplishment . Methods for teaching use of literature sources in Biology . Methods for teaching general concepts of living organisms . Methods for teaching research tools in Biology

Table 2 (Cont.)
Information Requirements

Subject	Specify Objectives for the Course	Select Topics to be Included in the Course	Select Textbook and Supplementary Sources	Determine Depth of Coverage for Each Topic	Prepare Materials for Course
Biology 16		. Description of courses in Biology of Organisms being taught at other universities . Student background . Materials included in textbooks . Adaptive problems which organisms are faced with . Relationships between structures, functions, and environments	. Information on published textbooks . Information on available single topic monographs		. Texts and general reference books covering content areas included in the course . General background materials in topic areas where the professor has limited knowledge . Methods for teaching research tools in Biology . Methods for teaching use of literature search tools . Original papers which are specific to the equipment and techniques to be used in the laboratory

Table 2 (Cont.)
Information Requirements

Subject	Specify Objectives for the Course	Select Topics to be Included in the Course	Select Textbook and Supplementary Sources	Determine Depth of Coverage for Each Topic	Prepare Materials for Course
History		. Characteristics of information support materials . Accessibility . Depth of coverage . Currency . Diversity of themes/perspectives . Amount	. Level of sophistication of available material . Student characteristics		

Figure 3). The criteria associated with text selection (Table 1) include material organization, recency of publication, topic coverage, and level of sophistication relative to student competence. The major information requirement identified by all 5 professors as relevant to the performance of this task was the need for descriptive material and critical reviews covering the content and level of treatment of textbooks currently available in their respective subject areas (Table 2). For selection of supplementary reading assignments, descriptive information on single topic monographs and articles was required.

The fourth task is the determination of the depth of coverage for each topic selected for inclusion in the course. Only two of the five professors considered this as a separate task. The basic considerations influencing decisions as to depth of coverage were the currency, urgency, and pervasiveness of the topics (Table 1). For each topic considered, information was needed regarding (1) the availability of materials on the topic and (2) the depth at which the topic was treated in the literature (Table 2).

The fifth and final task identified was the preparation of materials to be presented in the course. There are a number of processes involved in preparing a set of lectures, discussions, or laboratory problems (or experiments). Materials must be selected, read/scanned, summarized, abstracted or extracted, and integrated into a coherent presentation. The major consideration involves the establishment of guidelines for how to most effectively process and utilize the relevant material selected for review (Table 1). Additionally, most of the professors indicated a concern for making use of audio/visual aids where applicable or useful.

The material preparation task generates the major portion of the information requirements. In preparing lecture materials, the professor needs a variety of information on the specific topics to be presented. He needs texts and general reference books, selected articles from the professional literature, audio/visual material, answers to factual questions, and materials on teaching methods (e.g., methods for teaching the use of literature search tools -- see Table 2 for a detailed list).

2. Course Participation Tasks

The information related tasks which occur during the course conduct are, for the most part performed by students. These tasks are related to the accomplishment of class reading assignments, supplementary reading, laboratory problems and experiments, class participation, and term projects and papers. A variety of combinations of these tasks may be required in different classes; not all of them will be present in every class. An example of all the tasks combined into a single course is shown in Figure 4.

The first task, acquisition of basic principles, is usually supported by the lecture, the textbook, and provision of required materials on reserve in the library. An enterprising student however may well develop interest in identifying and locating relevant material beyond that required by the instructor.

The different types of student project tasks provide a variety of information requirements. Criteria for topic selection and topic refinement by students are similar to those identified by faculty in their course topic selection tasks (Table 1) with two additions: (1) the topic be

Figure 4

Course Participation Tasks
and Their Interrelationships

Task 1 Acquisition of Basic Principles	Task 2 Topic Selection	Task 3 Topic Refinement	Task 4 Topic Development	Task 5 Output
	A. Select general topic for class presentation	A. Narrow and refine topic	A. Develop topic for class presentation	A. Give class presentation
A. Attend class and read assignments	B. Select general topic for laboratory project	B. Plan laboratory project	B. Conduct laboratory experiment	B. Write laboratory report
B. Take course examinations	C. Select general topic area for term paper	C. Narrow and refine term paper topic	C. Develop specific topic	C. Write term paper

specific enough for the student to develop and handle within the constraints of time and background, (2) some information or raw data on the finalized topic be available or obtainable. In applying these latter criteria the student will usually consult with either or both the professor and the information specialist. The information needed to support the topic selection tasks usually takes the form of general works and review articles.

The next set of tasks, topic development and output, places the greatest information requirement on the switching center system. Depending on the objective of the assignment the service needed may range from minimal guidance in bibliographic searching to extensive searching and provision of material by the information specialist. One particular requirement for certain student projects is the preparation of visual aids in the form of graphics, illustrations, slides, transparencies, or films.

3. Summary

For each of the major tasks identified in course preparation, conduct, and participation, it was possible to delineate categories of informational support. The initial tasks in course preparation which deal with selection processes require information on the characteristics of topics and materials: how current they are, how broad they are, how well developed they are, and how effectively they are organized and presented. The task involving the preparation of materials for course presentation requires the provision of content and methodological information (primary sources) in the topic areas to be presented. Thus, descriptions characterizing the topics are needed first followed by information in the topic areas themselves.

The information-related tasks occurring during course preparation are reading assignments, laboratory problems, class presentations and term projects and papers. The information needed to support these tasks ranges from factual textbook type material to primary source material and includes non-print as well as print material.

The completed task analyses and related information requirements are used by information specialists on the library staff as a structure for providing responsive services. As services are provided, they are evaluated by the professor and students. The task analyses may be updated by the information specialists as new information and service requirements occur. Frequent interaction between the information specialist and the professor and students is required to insure an adequate flow of information requests, feedback, and the provision of satisfactory services.

E. Content Characterization

A content structure was desired to characterize the subject of each course in the experimental sample and to provide system continuity in the event of system personnel change. The tools used in this characterization include: (1) a detailed subject analysis, (2) a structured list of subject headings, and (3) a modified uniterm index system. The subject analysis is constructed to reflect the professor's concept of a given course, the topic areas emphasized, and the relationships perceived. The structured list of subject headings derived from the subject analysis serves to reflect the terminology used by the professor. The third tool, the uniterm index provides a system for classifying the documents obtained in each subject area.

1. Subject Analysis

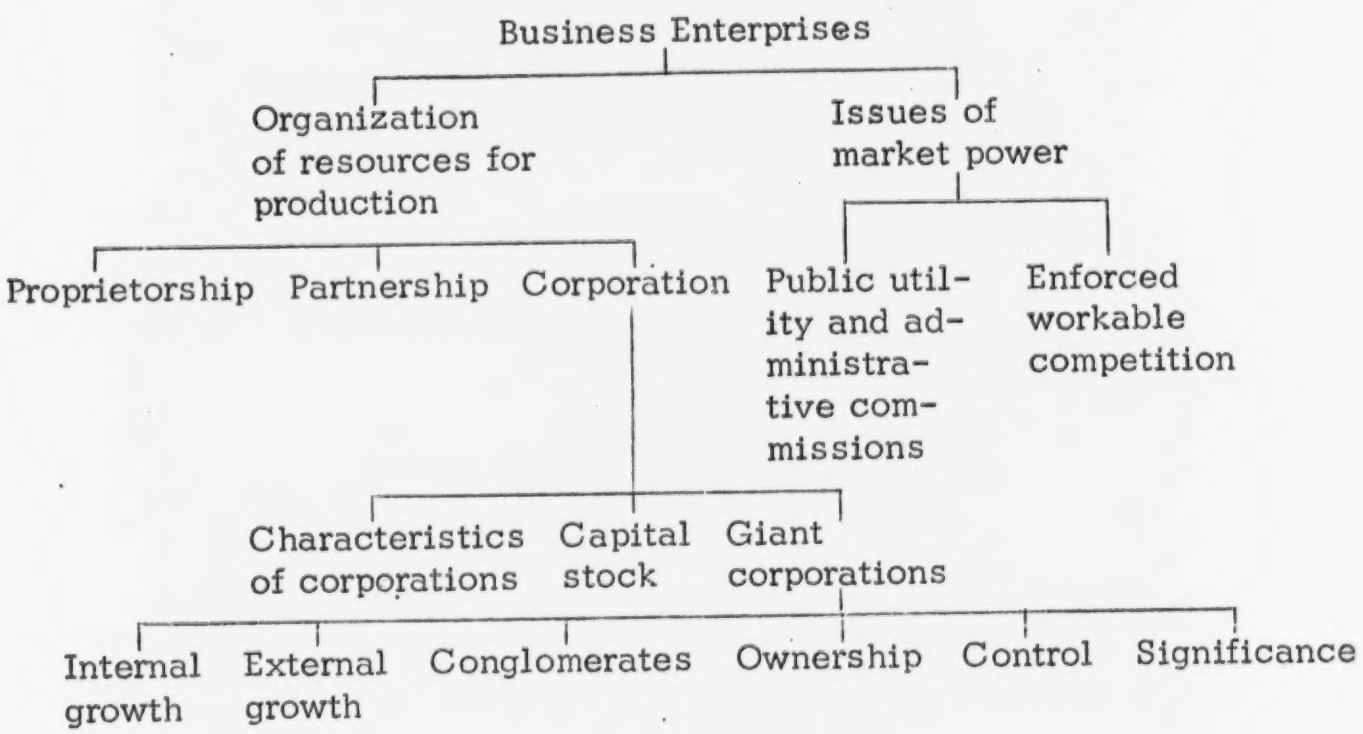
The subject analysis is developed through a series of in-depth interviews between an information specialist and the professor. The first step in these interviews is the determination of the topics and subtopics included in the course and the areas emphasized. This step is facilitated by the use of materials which the professor has prepared on topic presentations for the course such as (1) course outline or syllabus, (2) reading lists, and (3) tables of contents of textbooks. Through a series of discussions the information specialist and the professor develop a detailed description of each topic. These descriptions reflect the professor's perspective on each topic, the depth of detail with which each will be treated in the course, the way in which the professor relates the topic areas to each other, and the terminology which the professor uses in conjunction with each topic area.

In the case of the history course it was decided to relate the professor's description of the topics to the general subject field as a whole. This was accomplished through a general review of the literature in the subject field focusing on topics included, topics emphasized, and topic relationships established. The results of this review, together with the professor's description, were used to construct a rough classification of the subject, including all the major topics. This preliminary classification attempted to emphasize the topics which the professor emphasized and to relate the topics as he related them. The classification was presented to the professor in a tree diagram or outline form (see Figure 5, Part I) for review and modification. Several sessions between the information specialist and the professor were required to generate a subject

Figure 5
Development of Content Characterization

Part I. Sample Subject Analysis of Business Enterprises

Tree Diagram



Outline

I. Business enterprises

A. Organization of resources for production

1. Proprietorship
2. Partnership
3. Corporation

a. Characteristics of corporations
b. Capital stock
c. Giant corporations

(1) Internal growth
(2) External growth
(3) Conglomerates
(4) Ownership
(5) Control
(6) Significance

B. Issues of market power

1. Public utilities and administrative commissions
2. Enforced workable competition

analysis which the professor felt was representative of his course and the literature in the field. Further modifications to this analysis will be required after experience with it in the course.

The basic functions of the generated subject analysis include:

- The definition and documentation of topic and terminology relationships which were previously only in the mind of the professor.
- The provision of a framework for interpreting the information requests put to the system as a result of the course.
- The provision of a framework to help the student see each concept in context.
- The provision of a basis for developing the structured list of subject headings.

2. Structured List of Subject Headings

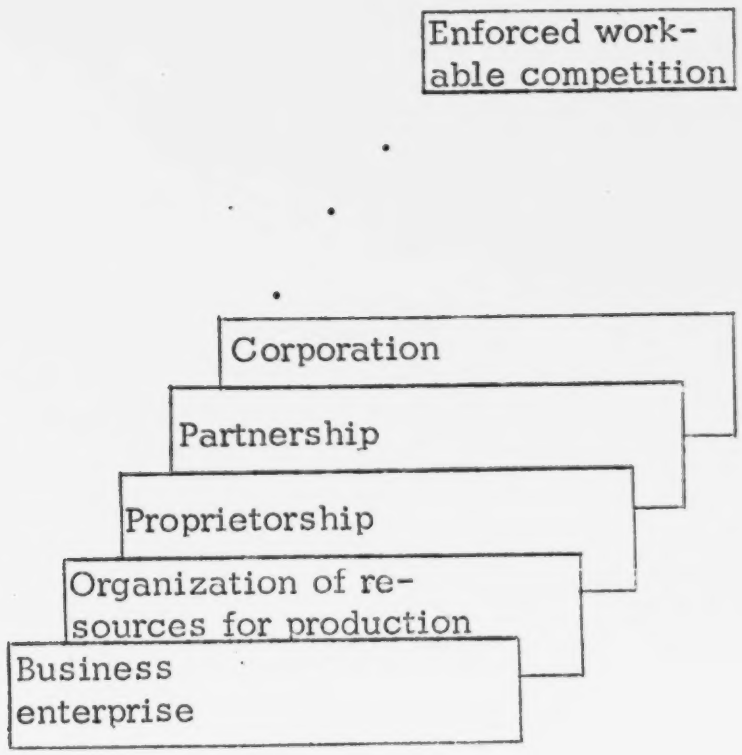
The development of a structured list of subject headings from the completed subject analysis is a mechanical operation. Essentially, this list is an alphabetical arrangement of all the terms used in the classification schedule. After each term is a description which relates it to the original schedule. The function of the list is to guide the student in examining a term to see its various interrelationships to other terms in the field; i.e., it shows those terms which are broader, those which are related on the same level, and those which are narrower or subordinate.

The procedures followed in developing the structured list of subject headings are shown in Figure 5, Part II, Steps 1-4. The first step involves the development of a set of 3 X 5 cards; each card containing a term used in the subject analyses. The next step (Step 2) is to enter on each term card the terms which are immediately superordinate (Broader Term -- BT) to the term, those which are related on the same level

Figure 5 (Cont.)
Development of Content Characterization

Part II. Development of Structured List of Subject Headings

Step 1: A note card is made for each term used in the classification schedule from beginning to end.



Step 2: The immediate surroundings of each term are recorded with B.T., R.T., and N.T.*notations.

Business enterprises

Business enterprises

Organization of resources for production

Issues of market power

Capital stock

Corporation

Characteristics of corporations

Capital stock

Giant corporations

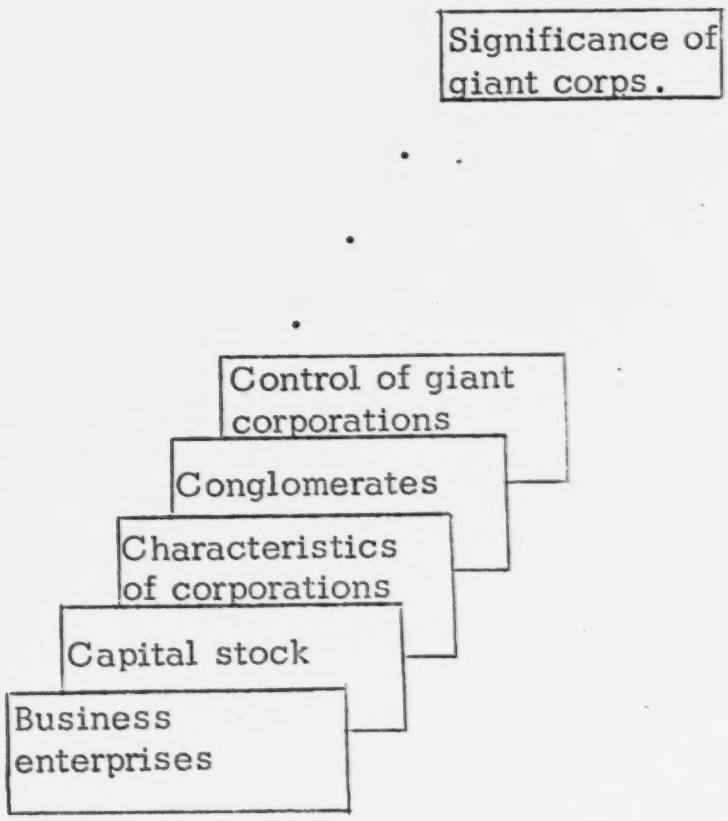
Business enterprises
N.T. organization of resources for production
issues of market power

Capital stock
B.T. corporation
R.T. characteristics of corporations
giant corporations

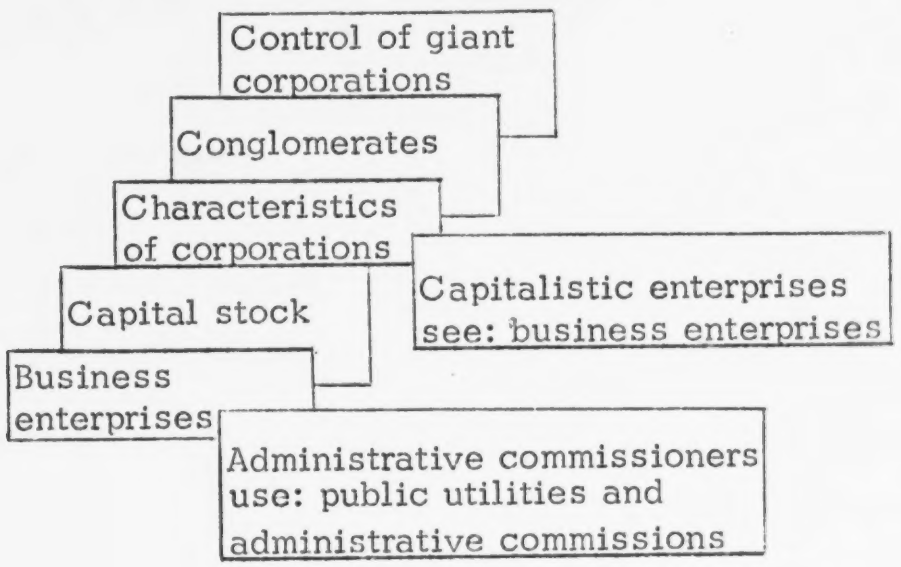
*BT - Broader Term RT - Related Term NT - Narrower Term

Figure 5 (Cont.)
Development of Content Characterization

Step 3: The cards are arranged in alphabetical order.



Step 4: Cards are added for synonyms, near-synonyms, and terms commonly used in the literature which the professor either omits or to which he ascribes other than the commonly used meaning.



(Related Term -- RT), and those which are immediately subordinate (Narrower Term -- NT). Once this procedure is completed for every term card, the cards are arranged in alphabetical order (Step 3). The final step is to add cards for synonyms, near synonyms, and related terms (Step 4). The cards developed in this step carry "see" and "use" instructions. When the structured list of subject headings is completed in card form it is transferred to standard 8 1/2" X 11" sheets of paper (see Appendix B for sample).

Copies of the structured list of subject headings are made available for use in the professor's office, in the information specialist's office, or in some cases given to each student.

3. Uniterm System

The third basic tool derived from the user-oriented subject analysis is a method of minimal indexing and record keeping. After it is decided a document should be retained for subsequent usage, it is indexed with all relevant terms from the subject heading list. The document identification number is recorded on a uniterm card for each of those descriptions and the document filed in a course file by identification number.

As with other uniterm systems there is a card for each term. Document numbers are recorded on the cards of the terms to which they apply in the column which corresponds to the last digit of the document identification number. See Figure 6. When performing a retrieval operation, the numbers on the cards are compared for each of the terms in the query. The system is different from the standard uniterm system in that subject

Figure 6
Uniterm System

Search Topic: Large Corporations in the U.S.

Corporations									
0	1	2	3	4	5	6	7	8	9
		182					27		

Conglomerates									
0	1	2	3	4	5	6	7	8	9
		182				36			

U.S.A.									
0	1	2	3	4	5	6	7	8	9
240		182	23		15	6 26			

#27

Financing for the Small Corporation

#182

The Tactics of the Corporate Takeover in U.S.

#36

Dealing With the European Conglomerate

#240

The Tennessee Valley Authority

headings may consist of more than one word.

4. Uses of Tools

In concept, the content structuring tools discussed in this section are of value to three groups: the professors, the students, and the information specialists. The professor uses the subject analysis to formulate and revise the structure for the course and to relate the various sections of the course. For the student and the information specialist, the subject analysis provides an overview of the course, showing the interrelationships of the topics included and their relative importance.

The second tool, the structured list of subject headings, aids the student in narrowing and defining a topic of interest and in discovering other closely related topics.

The third tool, the uniterm index, is useful to professors, students, and information specialists in determining what materials on a given topic have already been acquired and retained in the system.

System continuity can be provided by the content characterization tools described where they are applicable. In instances where they are not developed, course outlines, syllabi, and tapes of information specialist interviews of faculty can be used as substitutes.

III. External Resources

A. Introduction

Major functions of the information switching center are (1) to identify information resource centers external to Hamline University having materials and services which match the information requirements of Hamline users, and (2) to set us working arrangements with those resource centers which are willing to cooperate. This section of the report describes the survey of external resources and the results obtained from the survey.

B. Identification and Survey of External Resources

Information facilities which appeared to have materials and services matching the topic areas covered in the courses included in the pilot sample were identified through standard directories of information sources. These directories included descriptions of the subject areas in which the library specializes and the types of services it offers. In addition, a list of local information facilities was obtained. Altogether 195 facilities were identified. These facilities include: college and university libraries, civic organizations and research institutes, government agencies and information centers, public libraries, and industrial and commercial organizations.

Each of the 195 facilities was asked to respond to a one-page questionnaire. This questionnaire was designed to obtain information in the following major areas:

- The content characteristics of the collection: General subject areas collected in depth and special collections held.
- The services which are offered to other libraries: Specific services offered relative to its collection.
- The procedures required to make use of each service: Special forms and procedures to be used.
- The cost associated with each service.
- The turn around time associated with each request for service.

If a response was not received within two weeks of mailing the original questionnaire a follow-up questionnaire form was mailed. Of the 195 facilities surveyed, 170 (87%) responded to the questionnaire.

C. Survey Results

The results of the survey are shown in Table 3. Of the 170 respondents, 70% offered at least one service. The principal services identified were photoduplication (69 facilities), sale of microfilm copies (26 facilities), preparation of bibliographies (42 facilities), list of acquisitions (48 facilities), and interlibrary loan of books and other materials (80 facilities). Services offered with less frequency were selective dissemination, translation, and referrals. The turn around time for obtaining these various services ranged from 1 day to 2 weeks.

The average cost for photoduplication was 12 cents a page; for microfilm, 6 cents a frame. Some of the libraries offering these services required cash in advance. Prepared bibliographies and lists of acquisitions were generally treated as library publications; some of these were offered free, others had established costs from one to five dollars. Sixty-five of the 80 facilities offering interlibrary loan services used

Table 3
External Resource Survey Results:
Organizations Providing Services

Services	Colleges and Universities	Civic Organizations and Research Institutes	Government Agencies	Public Libraries	Industrial and Commercial Organizations	Other
Xeroxing or copying	41	11	6	7	3	1
Sale of Microfilm	14	3	3	5	1	
Preparation of bibliographies	17	8	11	3	2	1
Lists of acquisitions	19	12	11	2	3	1
Interlibrary loan	41	19	9	6	3	2
Mailing lists	14	14	16	1	3	

the Standard American Library Association format. Requests for other services in most cases were required in written form, however, no standard format was specified.

A Resource Characterization card file was developed from the survey results. Each card in this file carries a description of one information facility. Figure 7 provides an example of the card format. The file can be used by the information specialists as an aid to selecting the most probable resource to fill a specific request. As new resources are identified they will be added to the file.

D. Other Sources of Local Support

Locally the Hamline University library is participating in a cooperative network with six other small liberal arts college libraries. The current plans of the network call for making materials in each collection quickly available to all faculty and students of the participating institutions. A regular pick up and delivery service among the seven college libraries is currently operating. In addition, a union list of periodicals is under preparation. Longer range plans call for coordinating purchases, developing a centralized storage collection of little used materials and establishing a signle technical processing center for all participating libraries. Additionally, the Hill Reference Library in St. Paul, Minnesota is currently considering a proposal to provide switching center services to local colleges. This would be of significant value to the Hamline switching center in that many requests for materials could be funneled through the Hill Library.

Figure 7
Resource Characterization Card

Side 1

Resource _____

_____

_____

Librarian _____

Subject Areas _____

Services	Yes/ No	Time	Cost
Interlibrary Loan			
. Pictures			
. Microfilms			
. Books			
Translations			
Bibliographic Search			
Prepared Bibliographies			
Duplication			
Microform for Fee			
Mailing List			
Selective Dissemination			
Referral			
Index			
. Citation Index			
Publication List			

Side 2

Services	Procedures	Limitations
Interlibrary Loan . Pictures . Microfilms . Books		
Translations		
Bibliographic Search		
Prepared Bibliographies		
Duplication		
Microform for Fee		
Mailing List		
Accessions List		
Selective Dissemination		
Referral		
Index . Citation Index		
Publication List		

IV. System Operations and Services

A. Introduction

Theoretically the function of the switching center system is to work as an intermediary between the faculty and students and the information resources available for meeting their requirements. The user task analyses and content characterizations should provide the basis for determining the services to be provided, and the Resource Characterization File should be the principal guide to selecting and tapping relevant sources of information. To insure an efficient linking between the user and the materials, system tasks must be specified and procedures and forms must be developed.

This section of the report describes the results of a limited operation of the system on an experimental basis. The primary functions of this experimental operation were (1) to delineate the information service characterizations and the personnel tasks associated with the provision of the services, (2) to document the procedures associated with these tasks, and (3) to obtain evaluative feedback on the provision of services.

B. Experimental Operation

During the experimental operation of the system full information support was provided to two of the five courses in the pilot sample and partial support was provided to a third course. Support for the remaining two courses is underway in the spring term of 1970. The experimental system was staffed with two information specialists. Their principal functions included:

- The development and documentation of procedures for working with system users to better define their information requirements.

- The development and documentation of internal procedures and forms for providing services to the user.

- The development and documentation of procedures for obtaining materials from external sources of information.

- The design of forms to obtain feedback from the user as to the adequacy of the material provided by the system.

A substantial portion of the information specialists' time during the experimental operation was devoted to record-keeping tasks. As a means for documenting procedures, information specialists maintained detailed daily diaries.

1. Information Specialist and User Interaction

To establish an adequate flow of information requests, services, and user feedback, between 30 and 40 information specialist/professor contacts were required during the time period in which the course was prepared and taught. Some of these contacts involved extensive face-to-face discussions of specific topic areas and information requests, some were shorter sessions either in person or by telephone concerning a single question or request, some involved the delivery of materials, and some concerned the determination of the adequacy of materials and services provided. Additionally, information specialists attended class sessions to further their understanding of the subject matter and to better comprehend the professor's objectives, teaching methods, and the real problems which develop. Being in the class sessions helps the specialists establish contact with the students taking the course and provides an opportunity for the class members to raise questions and problems about information gathering for general discussion.

a. Information requests - During the early stages of support for course preparation activities, the principal contact with the professor took the form of extensive face-to-face interviewing. This allowed the information specialist (1) to become familiar with the specific topics of interest to the professor and their relative priorities, (2) to develop and modify the content characterization tools, (3) to receive, discuss and refine specific information requests, and (4) to obtain feedback on the specific support provided.

Throughout the sessions, the task analysis was used as a basic structuring tool. Each time a specific request was made by the professor, he was asked to describe the basis of his request (i.e., what use he planned to make of the information). In this way, each request was related to a task in the teaching model. If the request related to a task not included in the model, the model was revised accordingly. Each information specialist kept a notebook describing the specific request associated with each information requirement and each task.

Five general types of information requests were received from the professors being supported. These include (1) literature searches (retrospective, current awareness), (2) location of specific citations, (3) acquisition of material from a specific organization, (4) answers to factual questions, and (5) compilation of extracted material on a given topic. The categories of materials specified in these requests were original articles or books, review articles, bibliographies, abstracts, tables of extracted materials, compilations of facts, and various types of audio/visual materials.

Student requests for information generally resulted from course project tasks. Several of the students used the information specialist to help them define their topics and identify and locate materials relevant to their projects. Support took the form of literature searches, verification of specific citations, and delivery of potentially useful items. Many of the materials provided to the professor for course preparation were used by the students in developing their topics and producing their course projects.

b. Evaluative feedback - In the early stages of experimental system operation, the supported professors were asked to describe either verbally or in written form their evaluation of each service provided. This procedure was not particularly effective; first, because there was usually a time lapse between the review or use of specific material and the discussion focused on the evaluation of the material and second, because the evaluative response requested by the information specialist was not sufficiently structured. As a result a Material Evaluation Form was developed (see Figure 8). This form was attached to each piece of material delivered to the professor by the system. The first section of the form is filled out by the information specialist. This section states the topic covered and the task for which the material was provided. The second section of the form requires the professor to indicate whether the material was useful and the task(s) for which it actually was used. If the material was not useful, the form provides a section for indicating the reason. The information obtained from these forms allows the information specialist to adjust the services to better meet the requirements. It shows whether the material was useful for the originally specified task

Figure 8
Material Evaluation Form

To _____ Date _____ Code No. _____

For Topic or Subtopic _____

For Task _____

	Topic Selection	Text Selection	Preparation for Lecture	Preparation for Lab	Selection of Supplementary Reading Sources			
					Assigned Reading Lectures	Assigned Reading Lab	Optional Reading Lecture	Optional Reading Lab
Specifically Useful								
Generally Useful								
Not Useful								

If not useful:
_____ too general
_____ too specific
_____ too sophisticated
_____ too elementary
_____ irrelevant
_____ redundant
_____ too old
_____ other (specify)

Useful for:
_____ another course (please specify) _____
_____ another topic (please specify) _____

_____ I would like to have a copy
_____ Put _____ copies on reserve
_____ Other: _____

or for some other task(s) and it points out those characteristics of the material which made it unusable for the course. A similar form has been developed to obtain evaluative information from students.

2. System Internal Forms and Procedures

A set of internal processing forms was developed to document the steps, the cost and the time associated with filling each type of information request. The form designed to characterize a topic search request (Figure 9) includes information about:

- The user task or tasks which are to be supported by the request and the principal user of the resulting material (professor; student).
- The general description of the topic and the key words selected for initiating the search.
- The search strategy employed for identifying relevant items and places for obtaining these items.
- The general requirements specified by the user: time limits, bibliographic form, physical form (xerox, microfilm, etc.).
- The data for evaluation of the search (e.g., time required, number of items identified, percentage of order filled).

Three other request forms are included in the set: (1) location of a specific citation, (2) acquisition of information from a specified organization, and (3) answers to factual questions. These forms vary in minor ways from the form described above (see Appendix B). Each information request form is accompanied by a series of citation cards (Figure 10), each carrying a reference identified in response to the request. Both the information request forms and the citation cards were designed as data collection devices as well as system processing aids. When the system becomes operational, some of the categories of documentation will be omitted.

Figure 9

FORM A
DOCUMENT REQUEST
TOPIC INPUT

REQUEST NUMBER_____

1. Requestor's Name_____

2. Course_____

3. Activity:
___ topic selection
___ supplementary reading selection
___ lecture supplement
___ text selection
___ student topic selection
___ material preparation
___ other(_____)

4. Principal user:
___ professor ___ student

5. Request received ___ ___ ___ mo day yr
search initiated ___ ___ ___ mo day yr
search completed ___ ___ ___ mo day yr

6. Topic description_____

7. Key words selected for search_____

8. Search strategy:

A. Identify items_____

B. Identify resources_____

9. Time limits set by requestor_____

10. Bibliographic form desired by requestor:
___ full text
___ summary
___ abstract
___ extract
___ other (_____)

11. Physical form desired by requestor:
___ micro
___ xerox
___ original
___ other
___ book
___ journal article
___ manuscript
___ gov rept
___ other
___ map
___ picture
___ film or slide
___ other

12. Statistics for evaluation:
___ time required to identify relevant items
___ time required to identify best resource
___ number of items ordered
___ number of resources used

Percentage of order filled:
___ less than 1 week
___ 1 week
___ 2 weeks
___ unfilled
___ 3 weeks
___ 1 month

Figure 10
Citation Card

Code Number _____

Citation _____

_____

_____

Number of Resources Searched _____

Resource Selected _____

Dates:	request received	item located	item ordered	item received	item disseminated
	_____	_____	_____	_____	_____
	Mo day yr	Mo day yr	Mo day yr	Mo day yr	Mo day yr

Search Time _____

Cost _____

The information recorded on each request form covers the steps taken by system personnel to locate and obtain information relevant to the request. If the obtained information is not in the form desired by the professor, information specialists have to perform the additional steps associated with appropriately modifying the material. One example of this is the compilation of extracted material on a specific topic. Documentation of these tasks is included in the daily diaries.

Through an analysis of the data recorded on the request forms and in the diaries of the information specialists, a large number of tasks associated with the experimental system operation were identified. These tasks fall into five major categories:

- Identifying, finding, scanning, and selecting material relevant to each request.
- Locating, ordering, retrieving, delivering, and returning materials.

- Preparing products for distribution to the professor/student.
- Developing files of materials for the course (e.g., theory file, laboratory file, etc.).
- Keeping system records and data collection forms.

The specific tasks included in each of the above categories are shown in Table 4. Although most of these tasks were performed by information specialists during the experimental operation, many of them are clerical in nature. In one instance the professor developed and maintained the file of materials. Table 4 provides a general allocation of tasks between clerical and professional functions. Based on experience in the pre-system library operation at Hamline, a great deal of each of the professional tasks in the second category in Table 4 can be performed satisfactorily by clerical personnel under specialist training and supervision.

The following description provides an example of the sequence of internal processing steps required to fill a request. In this example, the professor has provided the system with a description of the general topic area. The product he desires is a compilation of extracts on this topic.

Step 1: A topic search request form is filled out indicating the teaching task associated with the request, the primary user of the material, the general description of the topic, and the characteristics of the product desired by the professor.

Step 2: Some general articles are read on the topic to help the information specialist provide better definition of the topic.

Step 3: A general search strategy is developed and pertinent bibliographic tools selected for use.

Step 4: Relevant key words/descriptors from the selected bibliographic tools are identified.

Step 5: A literature search is performed using relevant abstracting journals, bibliographies, tables of contents, etc. (This may be performed at the Hamline library or at another information facility.)

Table 4
System Personnel Tasks

Task Category	Professional Tasks	Clerical Tasks
Interaction with users	. Meetings with professors and students to establish information requirements and to obtain evaluative feedback . Attend classes for purposes of subject structuring . Structuring and organizing professors file	. Delivering materials to users
Identifying, finding scanning, and selecting materials	. Reading articles to understand request . Retrospective literature search - at Hamline - at other local libraries . Current awareness scanning on a regular basis . Review materials for relevance and level of sophistication . Review new books . Identify books and journals to be purchased for the library . Identify supplementary materials to be put on reserve	
Locating, ordering, retrieving, and returning materials		. Verify references . Check location of journals, books, visual aids - Check card catalog, shelf list, etc. - Check resource characterization file - Find addresses . Order materials - Form or letter - Telephone . Retrieve and return materials - Book store - Stacks - Acquisitions or cataloging office - Departmental libraries - Other local libraries

Table 4 (Cont.)

Task Category	Professional Tasks	Clerical Tasks
Product preparation	. Extracting . Abstracting . Summarizing . Compiling	. Sorting materials received . Typing excerpts, abstracts, summaries . Xeroxing . Collating, trimming, and stapling
File preparation	. Assemble articles into organized topics . Develop and update files . Assign terms to materials	. Maintain and update uniterm card file
Record keeping and data collection	. Develop record-keeping forms - Modify task charts - Develop subject characterizations and uniterm file . Fill out information request forms and citation cards . Organizing and reviewing card file . Fill out data collection forms for system evaluation . Record discussions with professors and students . Keep a daily diary	. Add to citation cards information on ordering, receiving, and disseminating material . Fill out data collection forms for system evaluation

Step 6: A citation card is filled out for each article, book, etc. identified as possibly relevant.

Step 7: The Hamline library is checked for articles and books identified as relevant to the topic. (If a book or article is not in the Hamline library and is judged to be of definite use, the information specialist will recommend that the library acquire it for the general collection.)

Step 8: The resource characterization file is checked for potential external sources.

Step 9: Bibliographic tools, such as the National Union Catalog, Union List of Serials, etc., are searched for specific location of books and articles.

Step 10: Books (ILL) and articles are ordered. (Pick them up or have them sent.)

Step 11: Received materials are reviewed/scanned for relevance. Unusuable materials are returned or discarded.

Step 12: If selected articles or books need to be returned, a copy of relevant material is made and collated.

Step 13: Relevant sections from books and articles may be extracted and compiled.

Step 14: A final draft of material to be delivered to the professor is typed. An additional copy for retention by the information specialist is made.

Step 15: A material evaluation sheet is attached and the material is delivered to the professor.

3. Experimental System Results

In support of the three courses, the staff of the switching center have ordered from external sources or obtained from the Hamline library 527 articles and pamphlets and have recommended that the Hamline library acquire 25 books and 13 journals for its permanent collection. In some cases the material received was free in other cases there were page charges for copying. Support was also obtained through interlibrary loan of books from local college libraries (members of the cooperative

program). Approximately 20% of the materials obtained by the switching center in response to user information requirements came from the Hamline collection.

From the materials collected, a number of files organized by major subject headings were created for each course (laboratory file, theory file, etc.). Many of the materials included in these files were first used by the professor for course preparation and later used by the students for outside reading, oral report preparation, laboratory project work, and term paper writing. Additionally, a materials file was developed and located in the library. The items in this file proved extremely useful to several students in developing their term projects. In some instances assigned and optional readings were placed on reserve at the library circulation desk. This was usually done when multiple copies were needed to permit all students to use the material in a given time frame.

During the experimental operation, data were obtained on material costs, search time, number of resources tapped, and turn around time for these resources (a breakdown of this information is shown in Appendix B). The average cost of the materials obtained was 90 cents per item. The search time required to identify a relevant document ranged from 2 minutes to 2 hours with an average time of 20 minutes. Overall 25 resources in addition to the Hamline library were used in support of three courses. For local resources such as the University of Minnesota, materials were obtained within one or two days; the time required by other resources such as government agencies and civic organizations ranged from 1 week to 5 months with an average time of 4 weeks. When outside resources in the Twin Cities were used every effort was made to perform off-site

tasks with system personnel and minimize the time material was unavailable to the institution's clientele. The exception to this was the use of member libraries of the cooperative organization, CLIC, which libraries have special procedures established to handle outside requests.

At the present time little objective data concerning the usefulness of the materials has been collected as the document evaluation forms were not in use during the major portion of the experimental operation. Subjectively, however, each of the professors has indicated that most of the material obtained for their support had been useful to them or to their students. In addition, the professors felt that the system saved them time and provided them with more material than they would have obtained on their own. It is planned to institute a measurement system to assess effectiveness of those courses supported during the fall of 1970.

V. Summary and Conclusions

The purpose of this study was to demonstrate the feasibility of adding a switching center service to the Hamline University library. The three major areas of concern were (1) to describe user information requirements in sufficient detail to specify system services, (2) to set up cooperative arrangements with other information facilities, and (3) to examine and delineate the internal system processing procedures required to link the user with the sources of relevant information. A number of tools were developed during this effort. These include:

- Descriptive models of the course preparation and course conduct activities of the five professors selected for the pilot sample.
- Subject characterizations of the courses based on the professor's perspective, the areas he emphasizes, the topic relationships he establishes, and the terminology he uses.
- Forms for collecting usage data from the professors and students supported.
- An external resource characterization card file describing the collections, services, procedures, costs, and response time associated with each resource identified.
- Information request forms and citation cards used for internal processing and data collecting concerning the system operation.
- Modified uniterm indexes for filing materials obtained by the system.

The development of descriptive teaching task models and subject characterizations served as a means for organizing the professor's ideas and activities relative to the course, as a structure for the provision of responsive information services by the system and as an aid to the information specialist in specifying and filling specific requests. As experimental system operations continue and services are provided, it is hoped

that a generalizable pattern of user tasks -- information requirements -- information services will be established. Such a pattern will provide a useful input for the determination of level of demand, frequency of demand, and time constraints associated with each service. The material evaluation forms attached to each item disseminated or filed will provide valuable guidance concerning the adequacy of each service and the ways in which it should be modified.

The resource characterization card file contains the results of a survey of information sources identified as having material relevant to the users' information needs. Approximately 120 resources are included in this file. Each of these resources provides services in one or more of the following areas: photoduplication, preparation of bibliographies, listing of acquisitions, interlibrary loan, selective dissemination, translation, and referrals. In addition to services, information costs, procedures, and response time are recorded for each resource. This file provides a means of identifying, comparing, and selecting resources to be used in filling service requests.

The information request forms and the citation cards have served two major functions in system documentation. First, they provide a record of each request and the materials obtained in response to that request. Second, they provide evaluative information on procedures followed, time required, and costs incurred.

The uniterm indexes were intended to serve as a quick means of characterizing and filing the materials received by the system. It was thought this indexing method would require a minimum amount of labor and materials,

provide flexibility in the number of terms combined to perform a search, and allow for easy updating. In fact the development and use of the uniterm indexing system has been very time consuming and of limited use. Observation and evaluation of its use and applicability are continuing to determine whether it should be discontinued.

The system tools provide a basic structure for the continued development and expansion of the experimental system. They serve as a basis for documenting (1) the information requirements of each user of the system (task models and content characterization), (2) the external resources identified and their degree of usefulness, (3) the forms and procedures required to describe the system's operating tasks and to provide responsive information services, and (4) the types of personnel needed to perform each system task. This documentation will insure the system's survivability independent of changes in operating personnel. A new information specialist can quickly adapt to the system. He can study the task models to understand the nature of the professors' tasks to be supported, the content characterizations to understand the perspectives and topical emphases that the professor imposes on the content of the course, and the course files, compiled bibliographies, reserve lists, and card catalog to assess the amount of information support already on hand. In addition, the history of use of various external resource centers will be retained to evaluate their relative effectiveness in fulfilling various service demands. For further continuity major faculty task modelling and topic definition interviews are being recorded for use by the information specialists.

The documentation of the system provides a basis for growth and change. As content areas develop, emphases shift, and a responsive faculty member

correspondingly shifts the emphases of his course coverage. Faculty turnover also brings about different perspectives on general content and the subject areas to be emphasized. These differences in perspective and depth of coverage require revision of the content characterization tools. These tools, therefore, are continually growing, dynamic, and responsive to change.

The progress made during this study has demonstrated the workability of the switching center system. At the present time, however, it is impossible to make an objective quantitative evaluation in terms of cost and effectiveness. First, little objective information is available on the usefulness of the system to the users. Subjective reports from the professors and students supported have indicated that the system has saved time and has provided more useful information than they might have obtained on their own. It is interesting to note that some students continue to obtain their own information and do not use either the developed files or the information specialists for assistance. During the next phase of experimental system operation, data will be obtained regarding (1) the direct usefulness of the material provided by the system and (2) the impact of the system services on the course-related tasks performed by professors and students. Second, true system operating costs are not readily available. During the experimental operation, information specialists are required to perform a number of functions which would not be included in fully developed operational systems. They perform all tasks (professional and clerical) associated with the provision of services, they serve as data collectors, and they develop and document system operating procedures. Measurement techniques and tools are currently being

developed to separate the time and cost associated with each of these functions. It is planned to obtain objective cost information for each type of service performed and to evaluate each service in terms of its impact on the users and the educational program.

Criteria

Topics should emphasize cell function rather than cell structure

Topics should emphasize general concepts and principles of living organisms

Topics s
tools/me
making g
from spe
ence

Tasks

Task 1
Specify objectives for the course
. Content goals
. Process goals
. Attitudinal change

Task 2
Select general topics to be included in the course

Information Requirements

Curriculum development discussions of Biology faculty

Student background

Information Service

Service Characteristics

Course Preparation

Topics should provide tools/methods for making generalizations from specific experience

Text should emphasize cell Biology from experimental point of view

Should integrate lab and lecture portions of course

Supply minimum of basic concepts and terminology

Task 3
Select textbook and supplementary sources

ack-

Ta
Determine
coverage
topic

Information on recent publications

Recent pr
literature
to be cov

Compilation of tables of contents of recent publication and characterization of depth and nature of content coverage

Circulation of choice magazine and publisher book ads

Biology

Current state of subject matter in rapidly evolving areas should be presented to students

Audiovisual should be us when possib

ent professional rature on topics e covered

Task 4
ermine depth of erage for each c

Task 5
Select specific topics and prepare materials (exercises) for course conduct

Location of all references included in the text

Methods for teaching how to use literature sources in Biology

Methods for teaching general concepts of living organisms

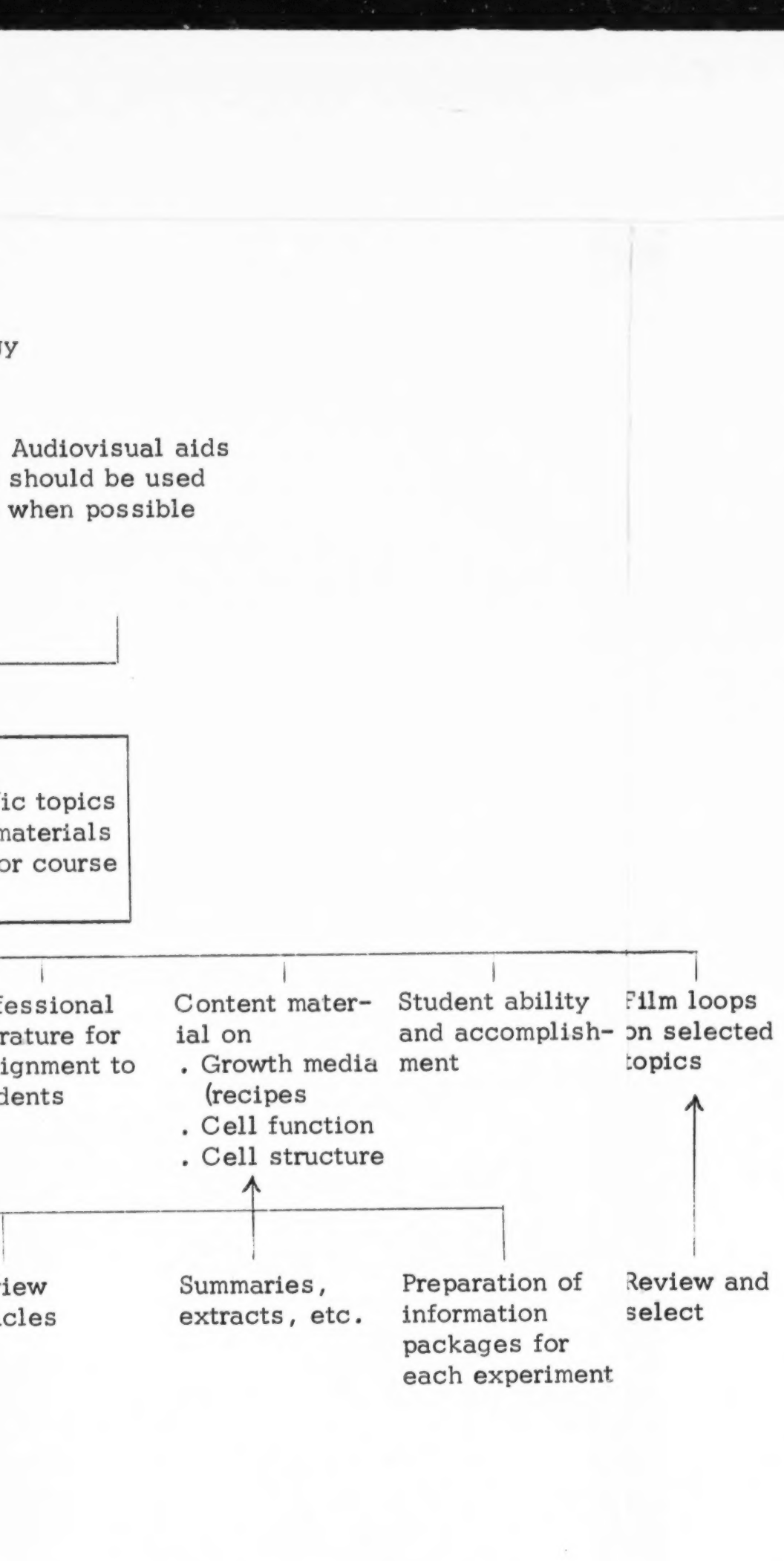
Methods for teaching research tools in Biology

Professional literature for assignment to students

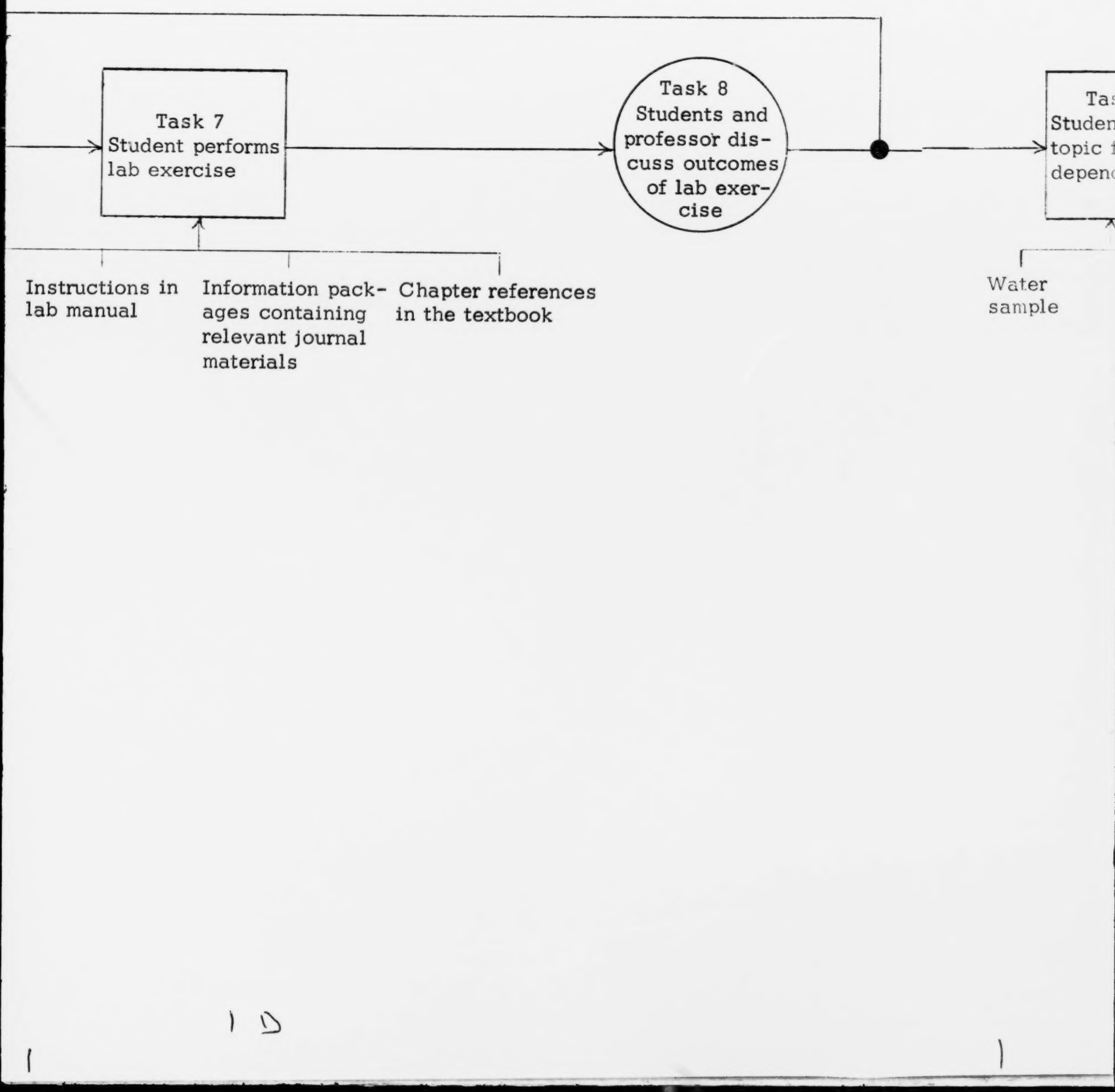
Journal reprints

Review articles

Compilation of where each reference is located in the local area

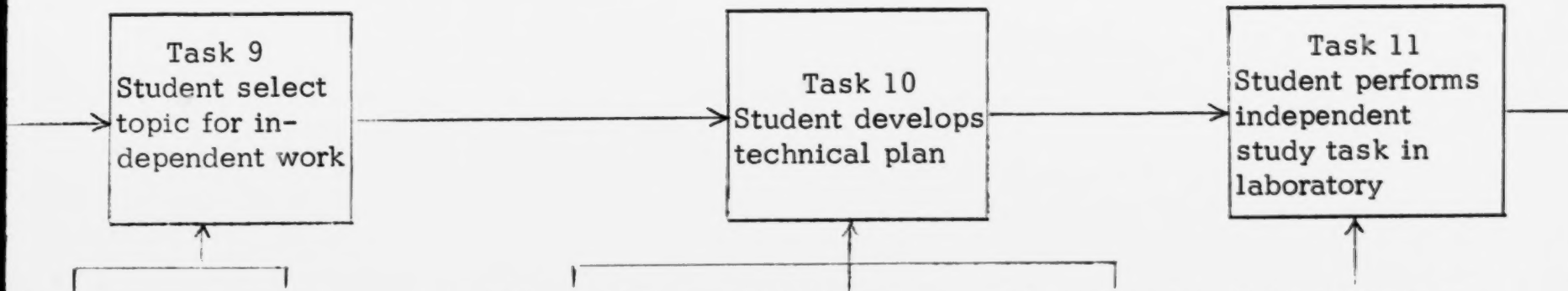

Audiovisual aids should be used when possible
ic topics materials or course
Task 6 Deliver orientation lecture
Instructions from professor
Content material on
. Growth media (recipes
. Cell function
. Cell structure
Student ability and accomplishment
Film loops on selected topics
Summaries, extracts, etc.
Preparation of information packages for each experiment
Review and select

CELL BIOLOGY


Task 7
Student performs lab exercise
Task 8
Students and professor discuss outcomes of lab exercise
Instructions in lab manual
Information packages containing relevant journal materials
Chapter references in the textbook
Water sample

Course Conduct

COURSE
Teaching
A Sample



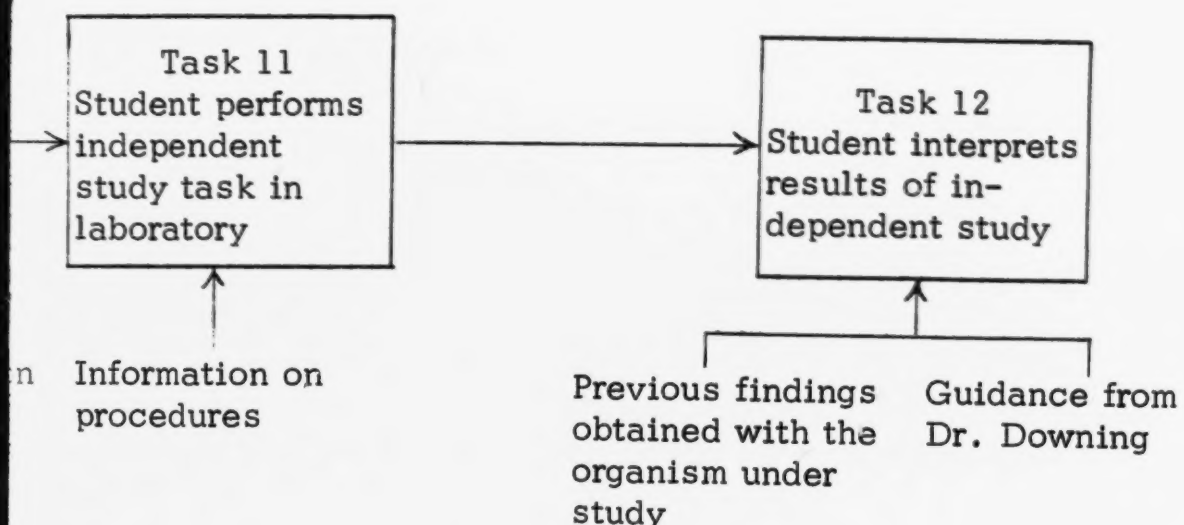
1E

APPENDIX A

COURSE CHARACTERIZATION

Teaching Task Models

A Sample Subject Characterization


Task 11
Student performs independent study task in laboratory
Task 12
Student interprets results of independent study
n
Information on procedures
Previous findings obtained with the organism under study
Guidance from Dr. Downing

HD 1F

1

Criteria

Laboratory topics should be broad enough to allow students to work at different levels depending on their ability

Topics should emphasize structure and function at the organismic level
. plants
. animals
. micro-organisms

Topics should include application of methods to content areas

Tasks

Task 1
Specify objectives for the course
. content goals
. process goals
. attitudinal change

Task 2
Select general topics to be included in the course

Information Requirements

Descriptions of courses in Biology of Organisms being taught at other universities

Background of students taking the course

Materials included in textbooks

Adaptive problems which organisms are faced with

Relati
tween
functi
viron

Information Services

Service Characteristics

nt

Course Preparation

Text organization should be compatible with course

Text should include both plants and animals

Supplementary materials should give good coverage of single topics

Task 3
Selection of tectbooks and supplementary sources

elationships be-
ween structures,
unctions, and en-
ironments

Information on available single topic monographs

Information on published text-books

Compilation of tables of contents of recent publications and characterization of depth and nature of content coverage

Lists of materials being used by other universities offering a course in Biology of Organisms

Circulation of Choice Magazine and publisher book ads

BI

Lecture materials and laboratory exercises should be integrated

Task 4
Select specific topic and prepare materials for course conduct

Texts and general reference books in course subject areas

Methods of teaching students to use literature search tools

General background materials in topic areas where the professor has limited information

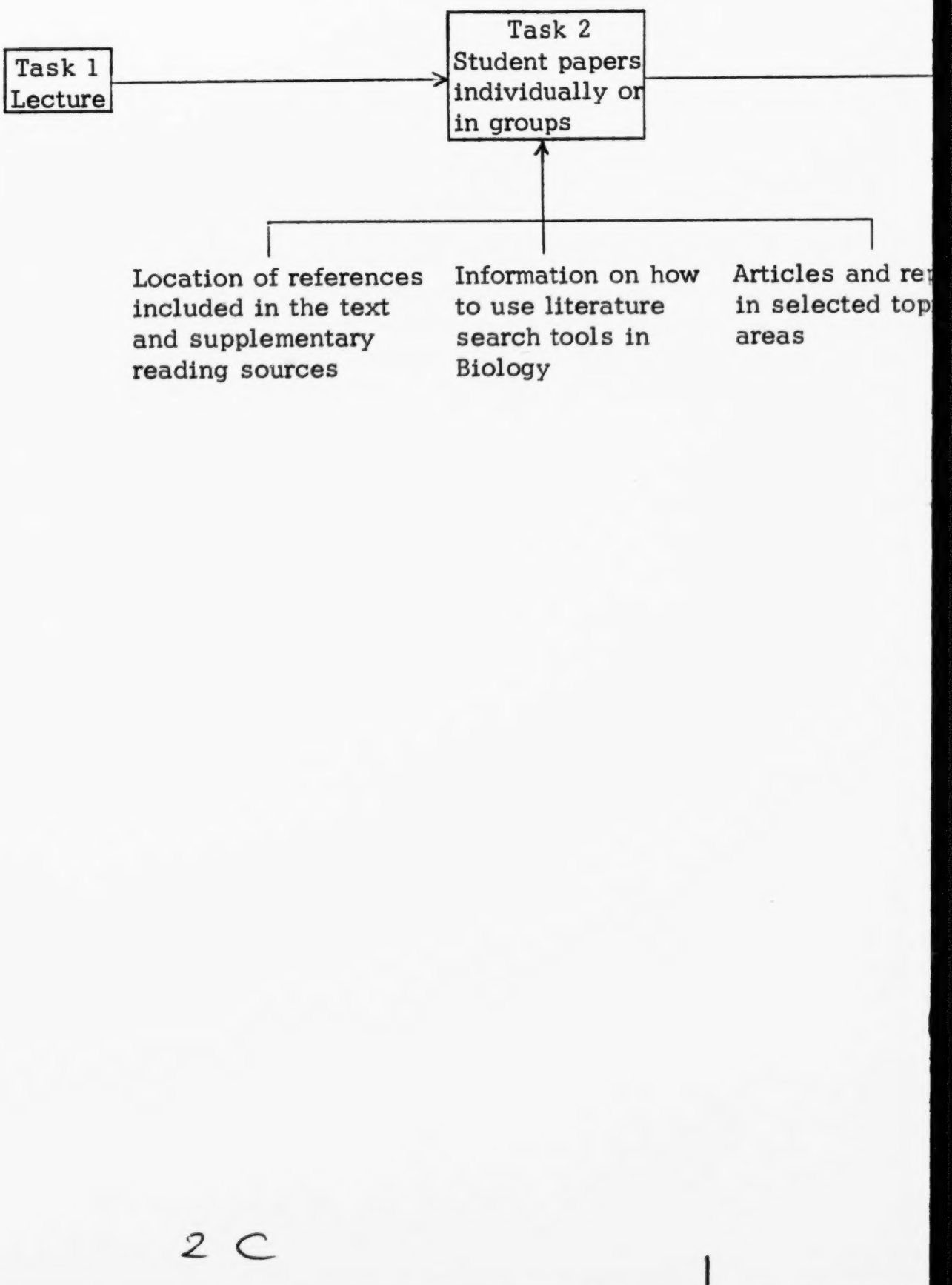
Original papers which are specific to equipment and techniques to be used in the laboratory

Metho
resea
Biolo

BIOLOGY OF ORGANISMS

2 B

Course Conduc

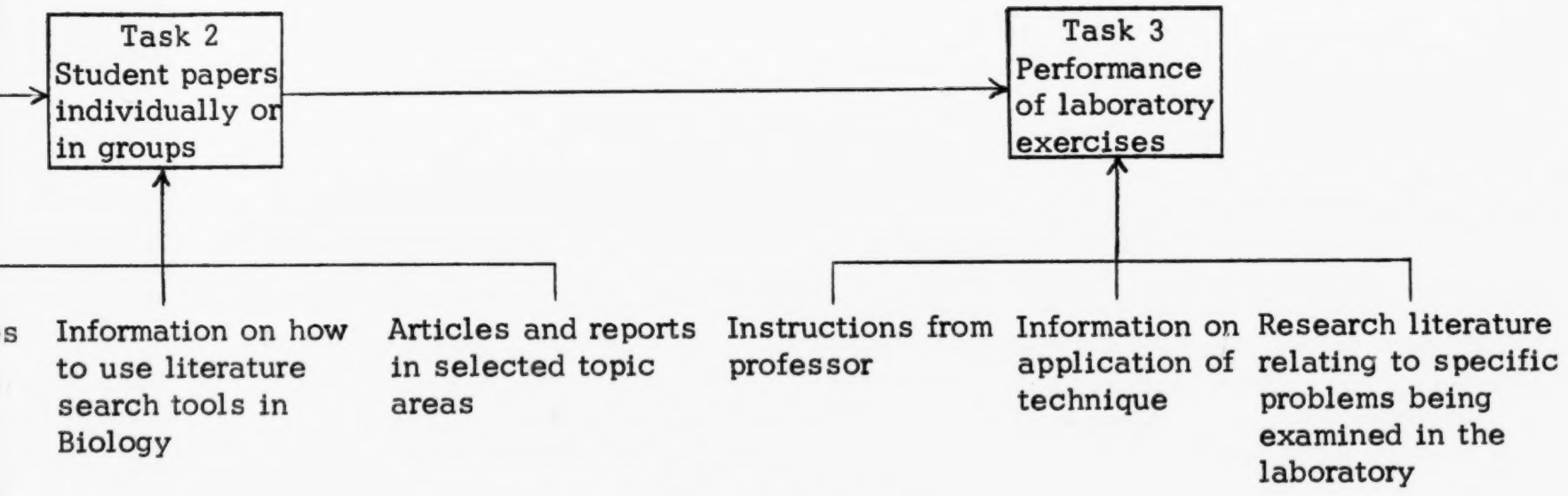

Task 1
Lecture
Task 2
Student papers individually or in groups
Location of references included in the text and supplementary reading sources
Information on how to use literature search tools in Biology
Articles and re
in selected top
areas

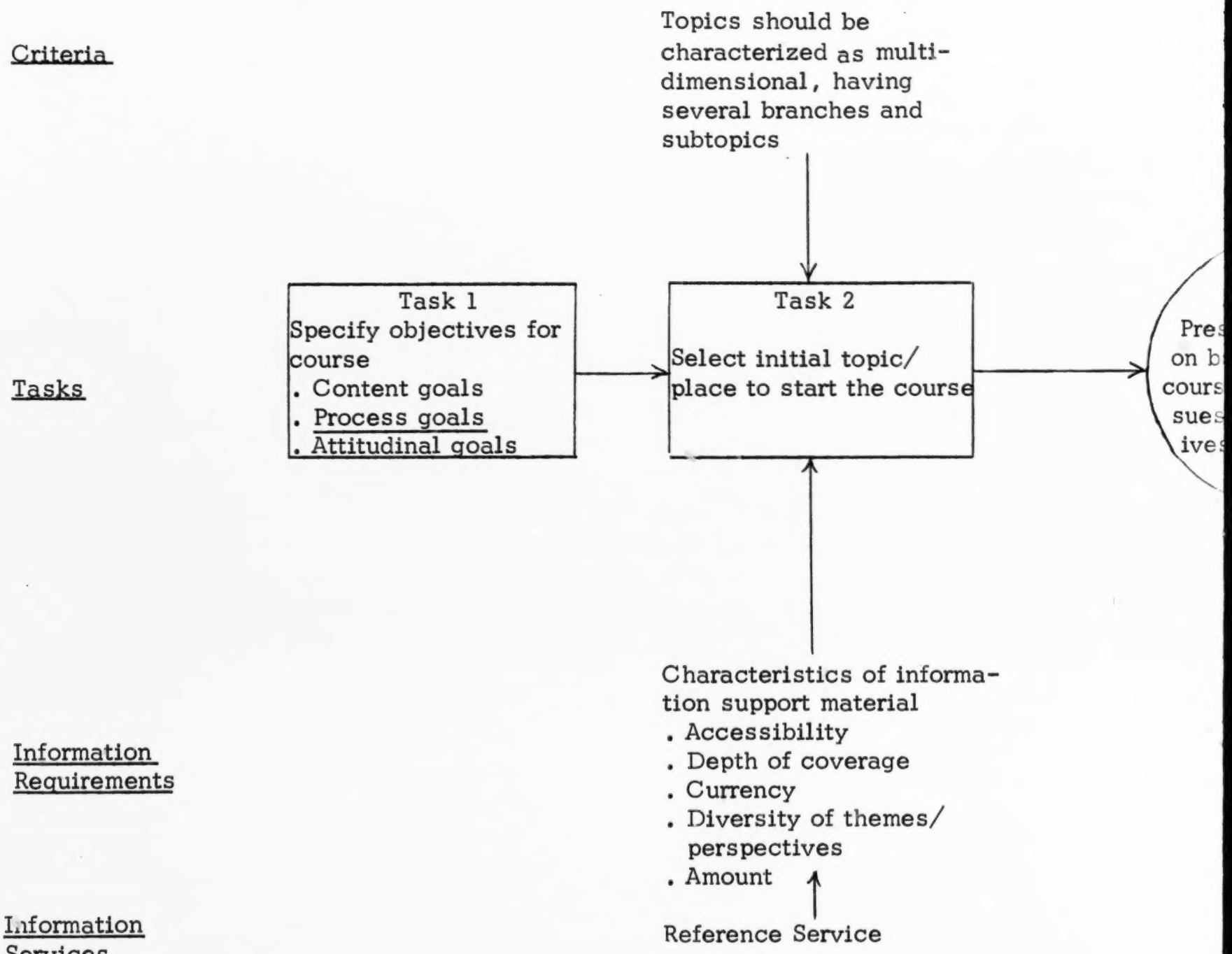
Methods for teaching research tools in Biology

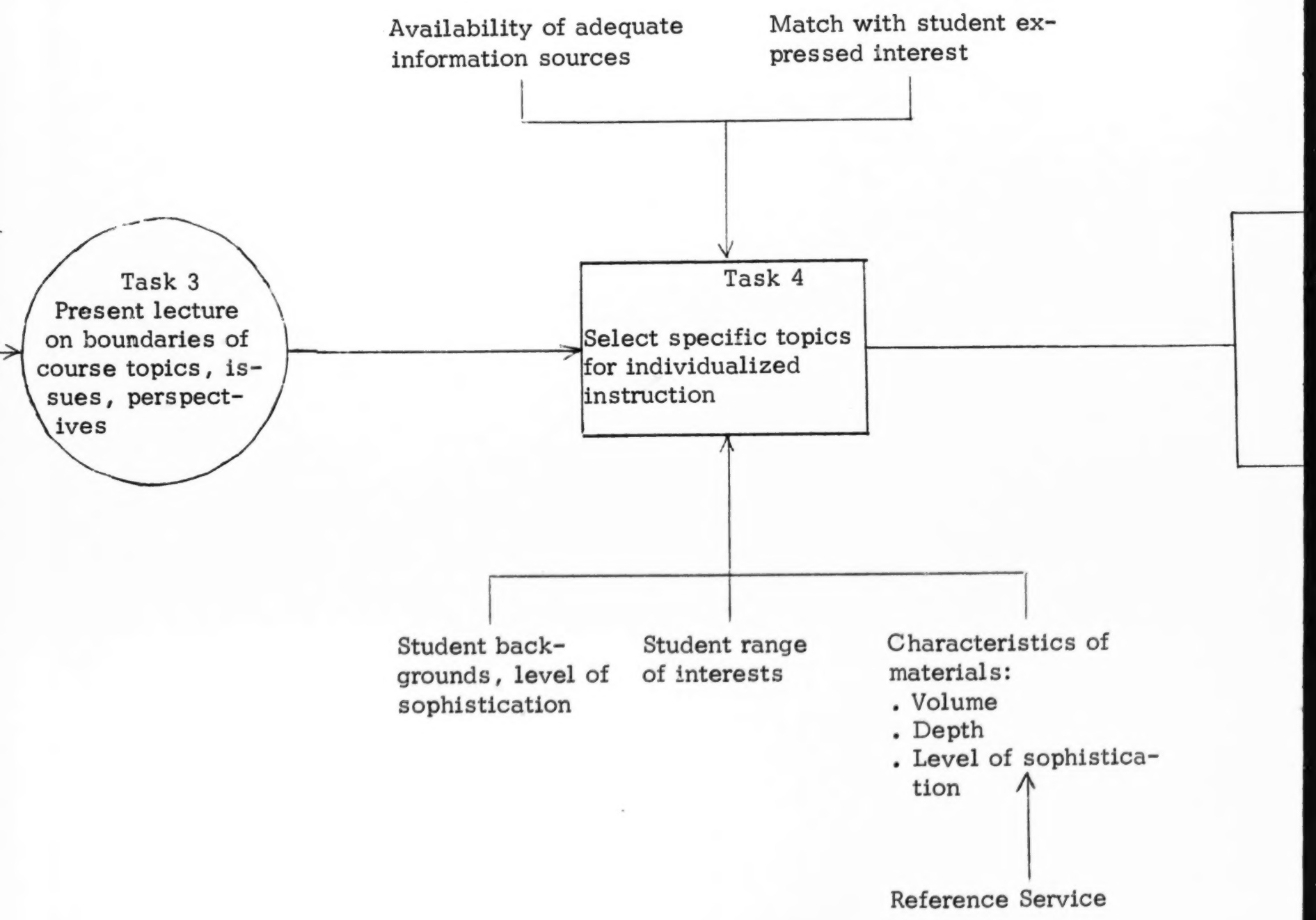
c

a-

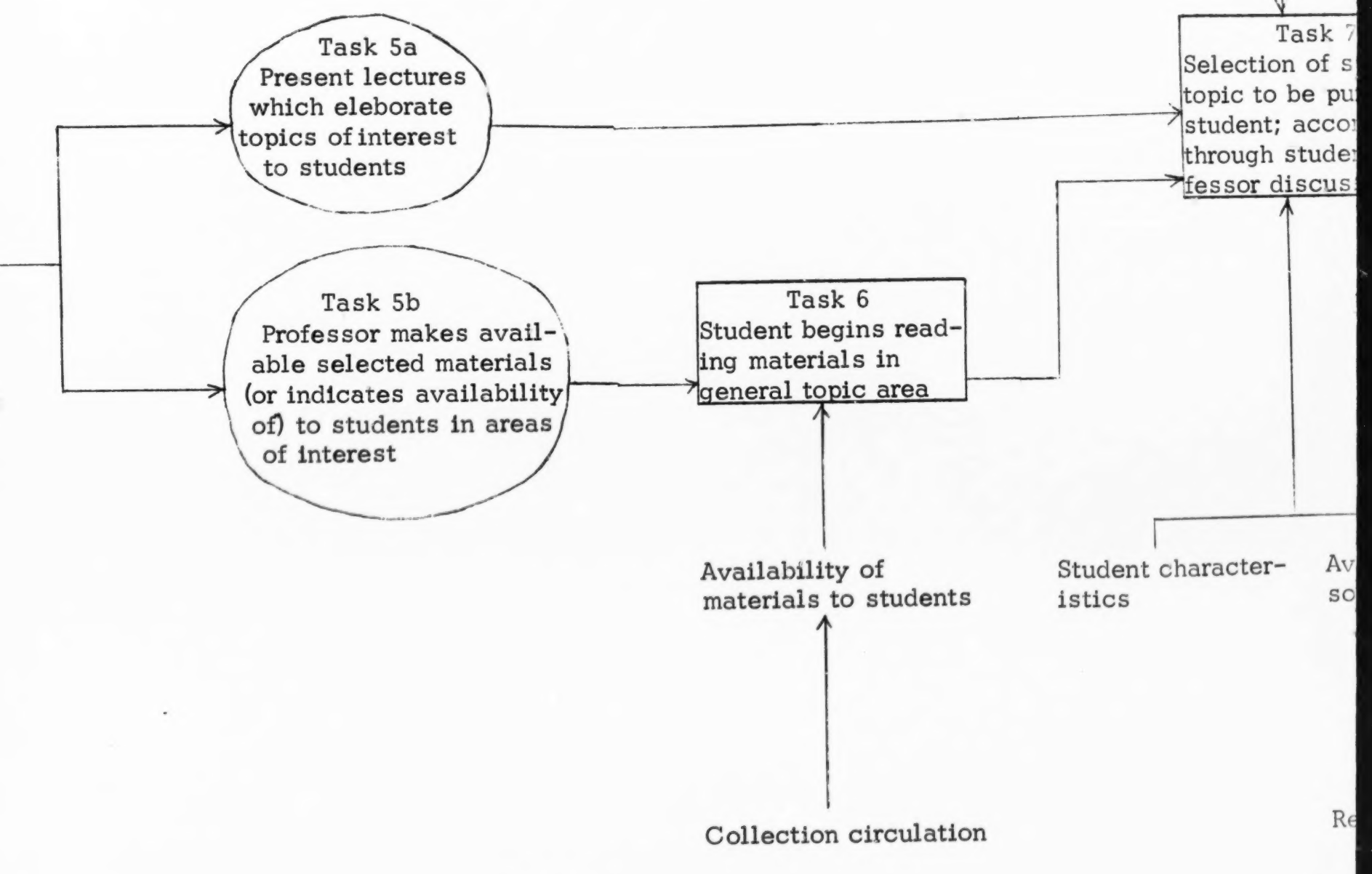
Course Conduct


Task 2
Student papers individually or in groups
Task 3
Performance of laboratory exercises
s
Information on how to use literature search tools in Biology
Articles and reports in selected topic areas
Instructions from professor
Information on application of technique
Research literature relating to specific problems being examined in the laboratory


Criteria
Topics should be characterized as multi-dimensional, having several branches and subtopics
Tasks
Task 1
Specify objectives for course
. Content goals
. Process goals
. Attitudinal goals
Task 2
Select initial topic/ place to start the course
Pres
on b
cours
sues
ives
Information Requirements
Characteristics of information support material
. Accessibility
. Depth of coverage
. Currency
. Diversity of themes/ perspectives
. Amount
Information Services
Reference Service
Service Characteristics


Availability of adequate information sources
Match with student expressed interest
Task 3
Present lecture on boundaries of course topics, issues, perspectives
Task 4
Select specific topics for individualized instruction
Student backgrounds, level of sophistication
Student range of interests
Characteristics of materials:
. Volume
. Depth
. Level of sophistication
Reference Service

History



HISTORY

3B

tch between stu-
nt level of compe-
ce and level of
terial complexity

Task 7
ection of specific
ic to be pursued by
dent; accomplished
ough student/pro-
sor discussions

Task 8a
Professor presents lectures to serve as models of how to develop a topic. Demonstration of how reconstructionist historian works

Task 8b
Students develop their own topics

Task 9
Preparation of papers by students

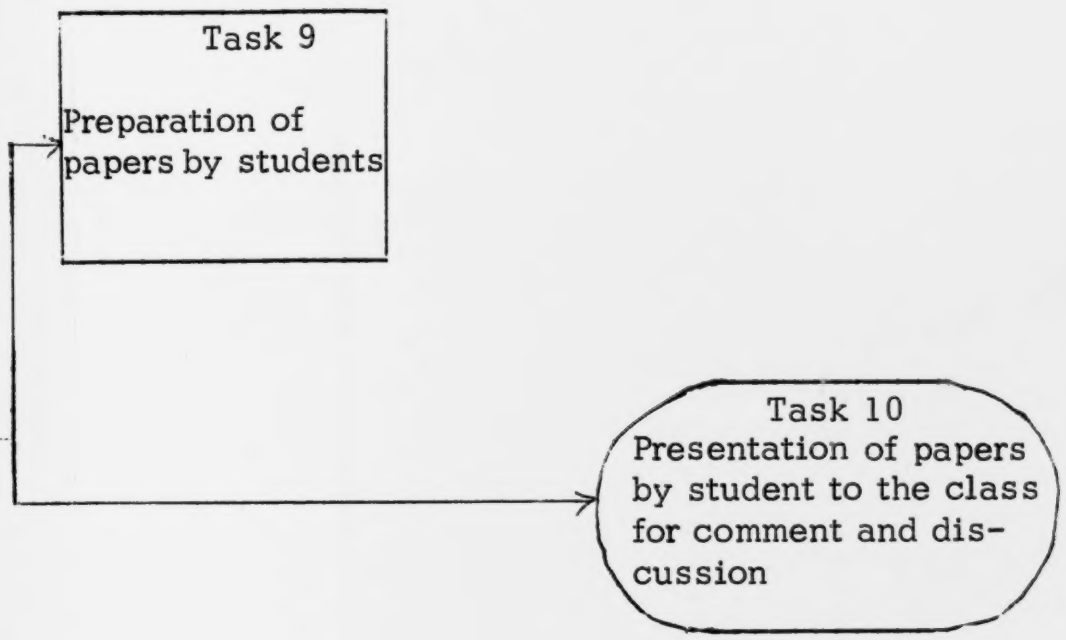
cter-

Available material sophistication

Reference service

- Materials relevant to central theme
- Possible perspectives to be pursued
- Contextual information, etc.

Reference and circulation


Task 9
Preparation of papers by students
Task 10
Presentation of papers by student to the class for comment and discussion

Criteria

Tasks

Task 1
Specify objectives for the course
. Content goals
. Process goals
. Attitudinal change

Information Requirements

Student Characteristics
. White middle class socio-economic background
. Lack of exposure to non-white dominated subcultures

Cultural context of the existing society

Basic sociological principles and concepts

Aw
ev
dis

Cu
ev
de
leg

Information Services

Service Characteristics

Topic should treat basic concepts, theories, and studies concerning prejudice and discrimination

Selected topics should be current and socially pervasive

Selection of text sh
be guided by recen
publication, facility
style, and comprehe
ness of coverage

Task 2

Select topics to be included in the course

Awareness of current events in prejudice/ discrimination, etc.

Historical context of current issues

Recent pu
selected

Current awareness of events, people, attitudes, studies, programs, legislation

Retrospective search service in requested areas for historical perspective

Compilati
contents
cations i
areas

Sociology

Selection of text should be guided by recency of publication, facility of style, and comprehensiveness of coverage

Text should be organized to treat major topics one at a time having all topics treated in each chapter

Supplementary material should compensate for text content weaknesses and emphasize recent and critical issues - material should provide good coverage of a narrow topic

Allocate
based o
vasiven
area

Task 3

Select text and supplementary sources

Recent publications in selected topic areas

Depth of content coverage, level of treatment of topics in available materials

Availabi
of cover
per topi

Compilation of tables of contents of recent publications in selected topic areas

Characterization of available materials re: depth and scope of coverage per topic area

Identifi
charact
availabl
resourc

SOCIOLOG

4 B

1

should
tent
size
es -
good
pic

Allocate time to topics based on judged pervasiveness of topic area

Currency and urgency of topics to students

Guiderules for abstraction/extraction of information content and characteristics
. Level of detail/abstraction
. Level of sophistication

Audio visu
should be
where pos

Task 4

Determine depth of coverage to be afforded each topic area

Task

Prepare mater
for course

Availability and depth of coverage of material per topic

Student characteristics
. Amount of information held about prejudice and related phenomena

Specific content material related to topics, subtopics, etc.

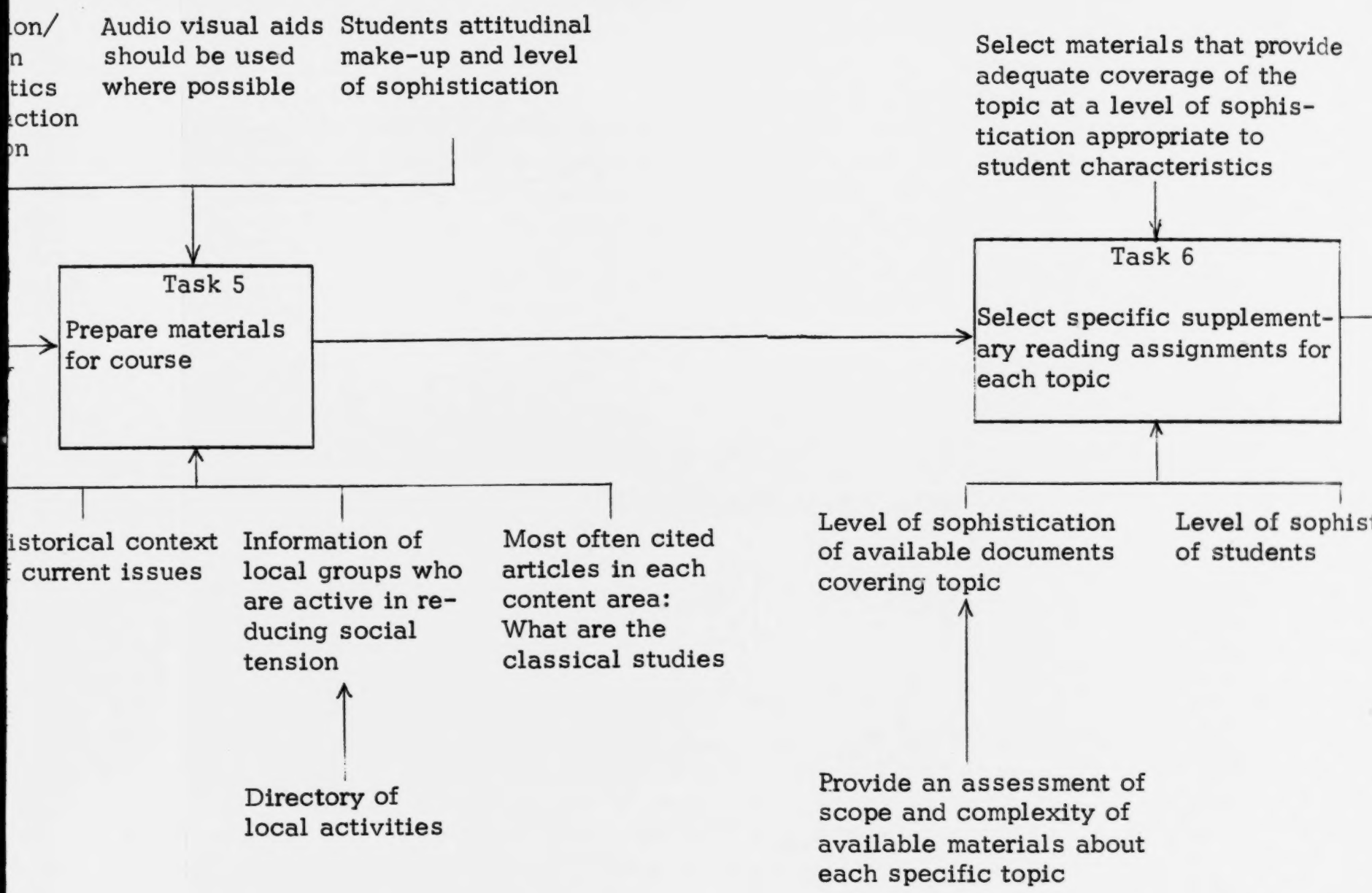
Historical context of current issues

Identification and characterization of available information resources

Provision of required content in prescribed forms (e.g., full text, abstracts, summaries, tapes, films, etc.)

SOCIOLOGY

4 C


ion/
n
tics
ction
on
Audio visual aids should be used where possible
Students attitudinal make-up and level of sophistication
Select materials that provide adequate coverage of the topic at a level of sophistication appropriate to student characteristics
Task 5
Prepare materials for course
Task 6
Select specific supplementary reading assignments for each topic
istorical context
current issues
Information of local groups who are active in reducing social tension
Most often cited articles in each content area: What are the classical studies
Level of sophistication of available documents covering topic
Level of sophist of students
Directory of local activities
Provide an assessment of scope and complexity of available materials about each specific topic

AD

Select materials that provide adequate coverage of the topic at a level of sophistication appropriate to student characteristics

Task 6

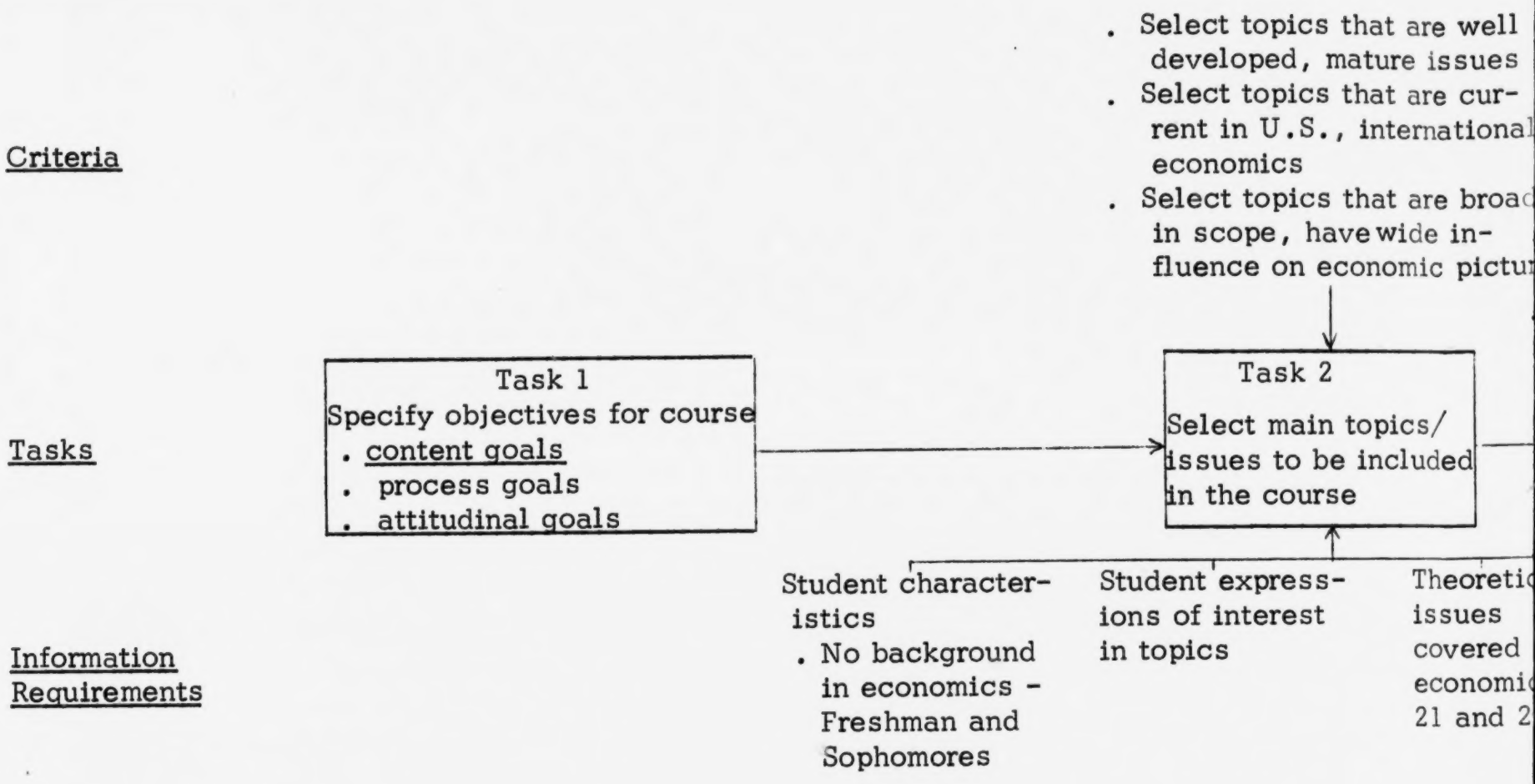
Select specific supplementary reading assignments for each topic

Present lecture

sophistication
ble documents
topic

Level of sophistication of students

n assessment of
d complexity of
materials about
cific topic


Criteria
. Select topics that are well developed, mature issues
. Select topics that are current in U.S., international economics
. Select topics that are broad in scope, have wide influence on economic pictur
Tasks
Task 1
Specify objectives for course
. content goals
. process goals
. attitudinal goals
Task 2
Select main topics/ issues to be included in the course
Information Requirements
Student characteristics
. No background in economics - Freshman and Sophomores
Student expressions of interest in topics
Theoretic issues covered economic 21 and 2

Information Services

Service Characteristics

that are well
nature issues
that are cur-
international

that are broad
ve wide in-
conomic picture

topics/
included
e

Theoretical issues covered in economics 21 and 22

Topic characteracteristics
- currency
- maturity
- sphere of influence

↑

- Issue identification
- Topic development monitoring-current awareness service

Task 3

Select text and supplementary sources

Recent publications in selected topicareas

Compilation of tables of contents of recent publications in selected topic areas

Pervasiveness of issue/to

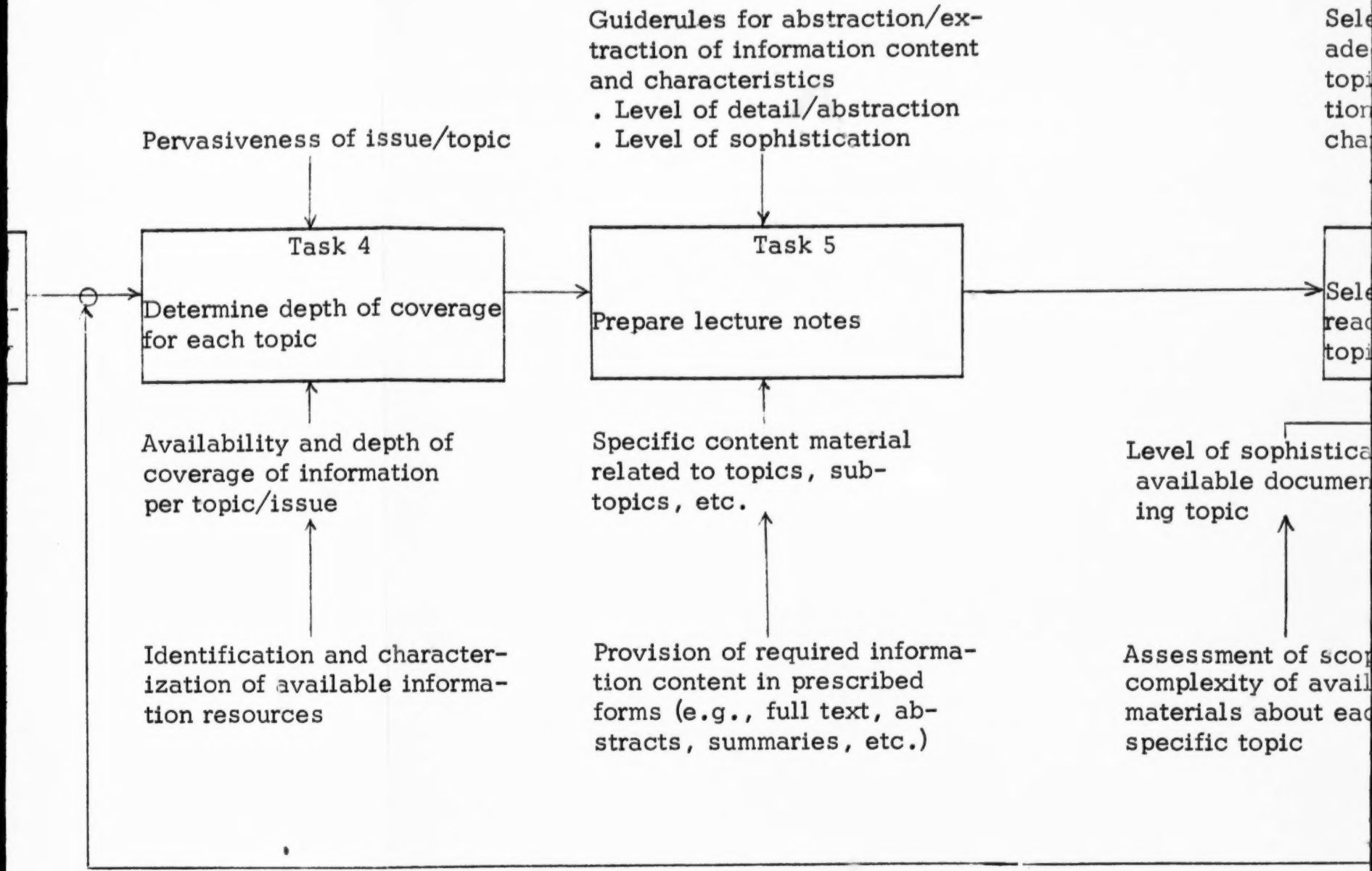
Task 4

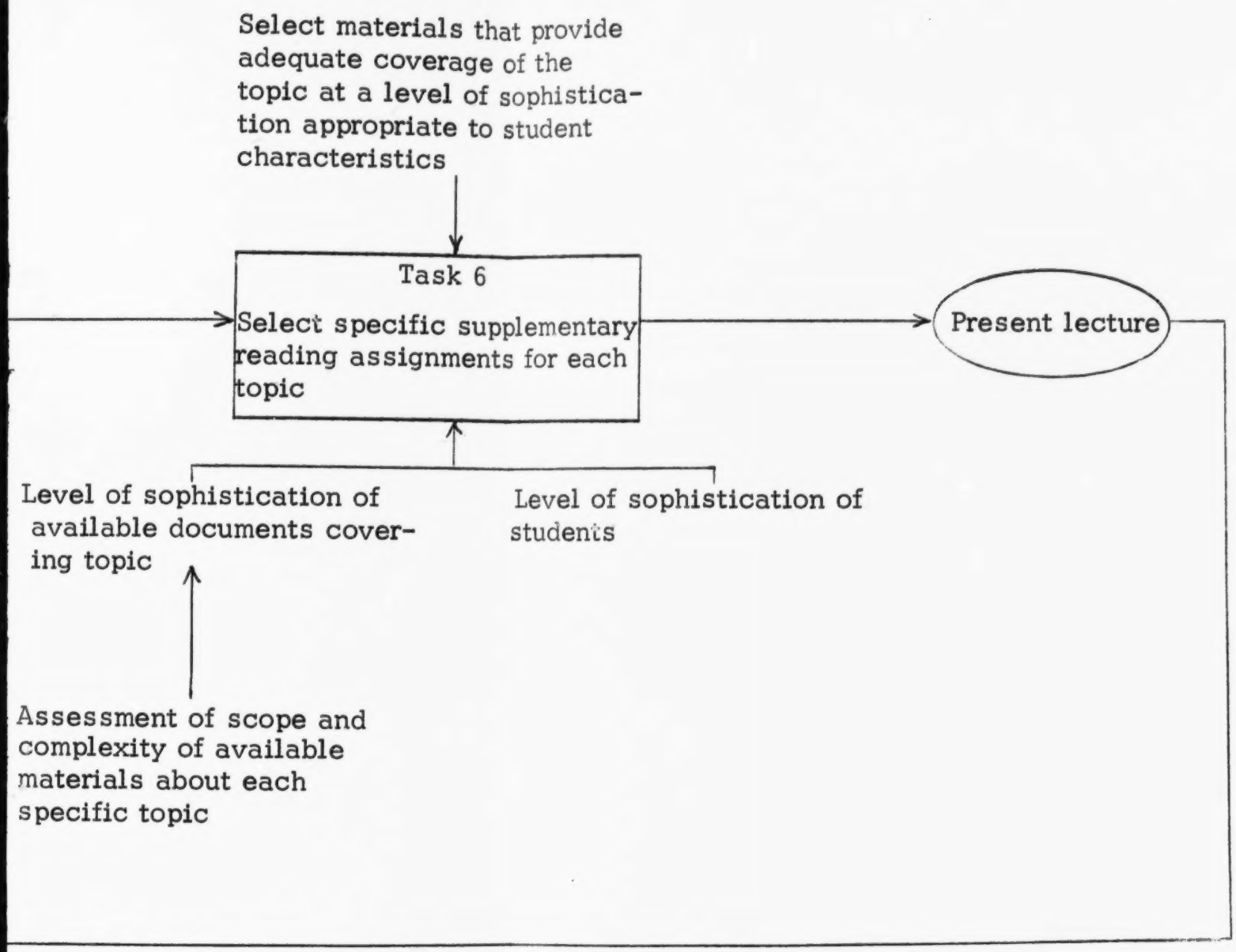
Determine depth of covera for each topic

Availability and depth of coverage of information per topic/issue

Identification and characte ization of available inform tion resources

Economics


Guiderules for abstraction/extraction of information content and characteristics
. Level of detail/abstraction
. Level of sophistication
Pervasiveness of issue/topic
Task 4
Determine depth of coverage for each topic
Task 5
Prepare lecture notes
Availability and depth of coverage of information per topic/issue
Specific content material related to topics, subtopics, etc.
Identification and characterization of available information resources
Provision of required information content in prescribed forms (e.g., full text, abstracts, summaries, etc.)


Select materials that provide adequate coverage of the topic at a level of sophistication appropriate to student characteristics
Task 6
Select specific supplementary reading assignments for each topic
Present lecture
Level of sophistication of available documents covering topic
Level of sophistication of students
Assessment of scope and complexity of available materials about each specific topic

Sociology Schedule

I. Bases of social differentiation

- A. religion
- B. race
  1. biological theory of race
  2. sociological theory of race
  3. psychological theory of race
  4. administrative theory of race
  5. religious theory of race
- C. wealth
- D. social class
  1. European estate system
- E. caste
  1. India
  2. U.S. South
- F. geographic origin

II. Kinds of majority-minority interaction

- A. majority attitudes
  1. prejudice
     - a. extremism
     - b. bigotry
  2. mixed
  3. tolerance
- B. majority actions
  1. assimilation
     - a. mode of interaction
       - (1) equalitarian
     - b. majority policy
       - (1) number of groups involved
         - (a) unilateral assimilation (acculturation)
           - Americanization
           - Anglo conformity
           - Europeanization

(b) bilateral assimilation (integration)*
(c) multilateral assimilation

- melting pot

(2) degree of freedom involved

(a) permitted assimilation
(b) forced assimilation
(c) legal protection of minorities*

2. discrimination

a. mode of interaction

(1) colonial
(2) imperial
(3) segregation

(a) apartheid

(4) reservation
(5) quasi-segregation

b. majority policy

(1) pluralism
(2) subjugation
(3) population transfer (direct, indirect)*

(a) immigration, quotas
(b) emigration, encouraged
(c) forced migration

(4) extermination

(a) genocido
(b) pogroms

III. Causes of prejudice and discrimination

A. group conflict

1. immigration
2. political conflict
3. economic conflict

(a) Jim Crow*
(b) Marxist theory of prejudice*

4. religious conflict
5. social tension

B. violence
C. frustration

1. scapegoating
2. targeting
3. displacement of hostility

D. Freudian theory
E. cultural factors

1. functional prejudices
2. traditional prejudices
3. stereotypes
4. social distance
5. consciousness of kind/dislike the unlike
6. principle of cumulation

(a) vicious circle
(b) beneficial cycle
(c) self-fulfilling prophecy

7. racial beliefs

IV. Consequences of prejudice and discrimination

A. on minority groups

1. individuals

a. biological

(1) life chances
(2) health

b. social

(1) marriage
(2) legal rights
(3) education
(4) employment
(5) housing*
(6) religious-cults

c. psychological

(1) universal*

(a) mental rigidity*

(2) attitude toward felt prejudice

(a) acceptance

- authoritarianism
- dogmatism

- acquiescence
- anomia
- quilt*

(b) avoidance (functional alternatives)*

- migration
- "passing"*
- ethnocentrism
  - . Zionism
  - . Black Nationalism

(c) aggression (hostility)

- humor
- boycott
- violence
- aggressive meekness
- chauvinism
- misanthropy
- displacement of hostility
  - . scapegoating
  - . projection
- reciprocal prejudice (Boerphobia)
- withdrawal of etiquette
- ostentatious display*
- non-violent resistance
  - . sit-ins
  - . freedom rides
  - . marches

2. families
   a. sex-role variations
3. large groups

B. majority group members
1. individual
   a. psychological
      (1) prejudiced personality type
   b. social
      (1) chauvinism*
2. groups

V. Reducing prejudice and discrimination

A. changing people

1. conscious

a. education

(1) formal
(2) informal

b. legislation
c. confrontation
d. contention*
e. exhortation
f. negotiation
g. psychotherapy

(1) group
(2) individual

h. political action

2. conscious and unconscious

a. assimilation

3. unconscious

a. race relations cycle*

B. changing situations

VI. Role of minorities in U.S. national life

A. economic

1. black capitalism

B. religious
C. political-legal

1. organizations

a. CORE
b. NAACP
c. ACLU

D. cultural-intellectual

Structured List of Subject Headings*

acculturation
see: assimilation, unilateral

actions, majority
B.T. majority - minority interaction, kinds of
R.T. attitudes, majority
N.T. assimilation
discrimination

Americanization
B.T. assimilation, unilateral
R.T. Anglo conformity
Europeanization

Anglo conformity
B.T. assimilation, unilateral
R.T. Americanization
Europeanization

apartheid
B.T. segregation

assimilation
B.T. actions, majority
R.T. discrimination
N.T. interaction, mode of (in assimilation)
policy, majority (in assimilation)

assimilation, bilateral
B.T. groups involved, number of
R.T. assimilation, unilateral
assimilation, multilateral

assimilation, forced
B. T. freedom involved, degree of
R.T. assimilation, permitted
protection of minotiries, legal

assimilation, multilateral
B.T. groups involved, number of
R.T. assimilation, unilateral
assimilation, bilateral
N.T. melting pot

assimilation, permitted
B.T. freedom involved, degree of
R.T. assimilation, forced
N.T. protection of minotiries, legal

assimilation, unilateral
B.T. groups involved, number of
R.T. assimilation, bilateral
assimilation, multilateral
N.T. Americanization
Anglo conformity
Europeanization

attitudes, majority
B.T. majority-minotiry interaction, kinds of
R.T. actions, majority
N.T. prejudice
attitudes, mixed
tolerance

attitudes, mixed
B.T. attitudes, majority
R.T. prejudice
tolerance

bigotry
B.T. prejudice
R.T. extremism

bilateral assimilation
use: assimilation bilateral

colonial
B.T. interaction, mode of (in discrimination)
R.T. imperial
segregation
reservation
quasi-segregation

degree of freedom involved
use: freedom involved, degree of

direct population transfer
use: population transfer

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* NOTE: Based on Section I of Sociology Schedule.

discrimination
B.T. actions, majority
R.T. assimilation
N.T. interaction, mode of (in discrimination)
policy, majority (in discrimination)

emigration, encouraged
B.T. population transfer
R.T. immigration quotas
migration, forced

encouraged emigration
use: emigration, encouraged

equalitarian
B.T. interaction, mode of (in assimilation)

Europeanization
B.T. assimilation, unilateral
R.T. Americanization
Anglo conformity

extermination
B.T. policy, majority (in discrimination)
R.T. pluralism
subjugation
population transfer
N.T. genocide
pogroms

extremism
B.T. prejudice
R.T. bigotry

forced assimilation
use: assimilation, forced

forced migration
use: migration, forced

freedom involved, degree of
B.T. policy, majority (in assimilation)
R.T. groups involved, number of
N.T. assimilation, permitted
assimilation, forced
protection of minorities, legal

genocide
B.T. extermination
R.T. pogroms

groups involved, number of
B.T. policy, majority (in assimilation)
R.T. freedom involved, degree of
N.T. assimilation, unilateral
assimilation, bilateral
assimilation, multilateral

immigration quotas
B.T. population transfer
R.T. emigration, encouraged
migration, forced

imperial
B.T. interaction, mode of (in discrimination)
R.T. colonial
segregation
reservation
quasi-segregation

indirect population transfer
see: population transfer

integration
see: assimilation, bilateral

interaction, mode of (in assimilation)
B.T. assimilation
R.T. policy, majority (in assimilation)
N.T. equalitarian

interaction, mode of (in discrimination)
B.T. discrimination
R.T. policy, majority (in discrimination)
N.T. colonial
imperial
segregation
reservation
quasi-segregation

kinds of majority-minority interaction
use: majority-minority interaction, kinds of

legal protection of minorities
use: protection of minorities, legal

majority actions
use: actions, majority

majority attitudes
use: attitudes, majority

majority-minority interactions, kinds of
R.T. social differentiation, bases of
prejudice and discrimination, causes of
prejudice and discrimination, consequences
prejudice and discrimination, reduction of
role of minorities in U.S. national life
N.T. attitudes, majority
actions, majority

majority policy
use: policy, majority

melting pot
B.T. assimilation, multilateral

migration, forced
B.T. population transfer
R.T. emigration, encouraged
immigration quotas

mixed attitudes
use: attitudes, mixed

mode of interaction
use: interaction, mode of

multilateral assimilation
use: assimilation, multilateral

number of groups involved
use: groups involved, number of

permitted assimilation
use: assimilation, permitted

pluralism
B.T. policy, majority (in discrimination)
R.T. subjugation
population transfer
extermination

pogroms
B.T. extermination
R.T. genocide

policy, majority (in assimilation)
B.T. assimilation
R.T. interaction, mode of (in assimilation)
N.T. groups involved, number of
freedom involved, degree of

policy, majority (in discrimination)
B.T. discrimination
R.T. interaction, mode of (in discrimination)
N.T. pluralism
subjugation
population transfer
extermination

population transfer
B.T. policy, majority (in discrimination)
R.T. pluralism
subjugation
extermination
N.T. immigration quotas
emigration, encouraged
migration, forced

prejudice
B.T. attitudes, majority
R.T. attitudes, mixed
N.T. extremism
bigotry

protection of minorities, legal
B.T. freedom of involved, degree of
R.T. assimilation, permitted
assimilation, forced

quasi-segregation
B.T. interaction, mode of (in discrimination)
R.T. colonial
imperial
segregation
reservation

reservation
B.T. interaction, mode of (in discrimination)
R.T. colonial
imperial
segregation
quasi-segregation

segregation
B.T. interaction, mode of (in discrimination)
R.T. colonial
imperial
reservation
quasi-segregation
N.T. apartheid

subjugation
B.T. policy, majority (in discrimination)
R.T. pluralism
population transfer
extermination

tolerance
B.T. attitudes, majority
R.T. prejudice
attitudes, mixed

unilateral assimilation
use: assimilation, unilateral

APPENDIX B
INFORMATION REQUEST FORMS

FORM A
DOCUMENT REQUEST
TOPIC INPUT

REQUEST NUMBER_____

1. Requestor's Name_____

2. Course_____

3. Activity:
___ topic selection
___ supplementary reading selection
___ lecture supplement
___ text selection
___ material preparation
___ student topic selection
___ other(_____)

4. Principal user:
___ professor ___ student

5. Request received ___ ___ ___ mo day yr
search initiated ___ ___ ___ mo day yr
search completed ___ ___ ___ mo day yr

6. Topic description_____

_____

_____

_____

_____

7. Key words selected for search_____

_____

8. Search strategy:

A. Identify items_____

_____

_____

B. Identify resources_____

_____

_____

9. Time limits set by requestor_____

10. Bibliographic form desired by requestor:
___ full text
___ summary
___ abstract
___ extract
___ other (_____)

11. Physical form desired by requestor:
___ micro
___ xerox
___ original
___ other
___ book
___ journal article
___ manuscript
___ gov rept
___ other
___ map
___ picture
___ film or slide
___ other

12. Statistics for evaluation:
___ time required to identify relevant items
___ time required to identify best resource
___ number of items ordered
___ number of resources used

Percentage of order filled:
___ less than 1 week
___ 1 week
___ 2 weeks
___ 3 weeks
___ 1 month
___ unfilled

FORM b
DOCUMENT REQUEST
CITATION INPUT

REQUEST NUMBER_____

1. Requestor's name_____

2. Course_____

3. Activity:

___ topic selection
___ supplementary reading selection
___ text selection
___ student topic selection
___ material preparation
___ lecture supplement

4. Principal user:

___ professor ___ student

5. Request received: ___ ___ ___ (mo day yr)

Search initiated: ___ ___ ___ (mo day yr)

Search Completed: ___ ___ ___ (mo day yr)

6. Search strategy for identifying resources_____

_____

_____

_____

_____

_____

7. Time limits set by requestor_____

8. Physical form desired:

___ micro ___ xerox ___ original ___ other (_____)

9. Statistics for evaluation:

___ time required to identify best resource
___ number of items requested
___ number of items ordered
___ number of resources used
___ percentage of orders filled:
    ___ less than 1 week
    ___ 1 week
    ___ 2 weeks
    ___ 3 weeks
    ___ 1 month
    ___ unfilled

FORM C
DOCUMENT REQUEST
ORGANIZATION/PERSON INPUT

REQUEST NUMBER_____

1. Requestor's name_____

2. Course_____

3. Activity:

___ topic selection
___ supplementary reading selection
___ text selection
___ student topic selection
___ material preparation
___ lecture supplement

4. Principal user:

___ professor ___ student

5. Request received: ___ ___ ___ (mo day yr)

Search initiated: ___ ___ ___ (mo day yr)

Search completed: ___ ___ ___ (mo day yr)

6. Topic limitations_____

7. Search strategy (person):

Identify resources_____

_____

_____

_____

_____

_____

8. Bibliographic form desired by requestor:

___ full text ___ abstract ___ extract ___ summary ___ other

9. Physical form desired by requestor:

___ micro
___ xerox
___ original
___ other
___ book
___ journal article
___ manuscript
___ gov rept
___ other
___ map
___ picture
___ film or slide
___ other

10. Statistics for evaluation:

Persons:

___ time required to identify items
___ time required to identify resources
___ number of items ordered
___ number of resources used

percentage of order filled:

___ less than 1 week
___ 1 week
___ 2 weeks
___ 3 weeks
___ 1 month
___ unfilled

Organizations:

___ number of items received
___ frequency of items received
___ time lag between publication and receipt

FORM D
DOCUMENT REQUEST
FACT RETRIEVAL

REQUEST NUMBER _____

1. Requestor's Name _____

2. Course _____

3. Activity:

_____ topic selection
_____ supplementary reading selection
_____ text selection
_____ student topic selection
_____ material preparation
_____ lecture supplement

4. Principal user:

_____ professor
_____ student

5. Request received: ___ ___ ___ mo day yr

Search initiated: ___ ___ ___ mo day yr

Search completed: ___ ___ ___ mo day yr

6. Question asked _____

_____

_____

_____

7. Search strategy (bibliographic tools and indexes used) _____

_____

_____

_____

8. Answer to question _____

_____

_____

_____

Where found _____

_____

9. Time limits set by requestor _____

_____

10. Statistics for evaluation:

_____ time required to identify relevant item
_____ number of items ordered
_____ number of resources used
_____ time required to obtain them